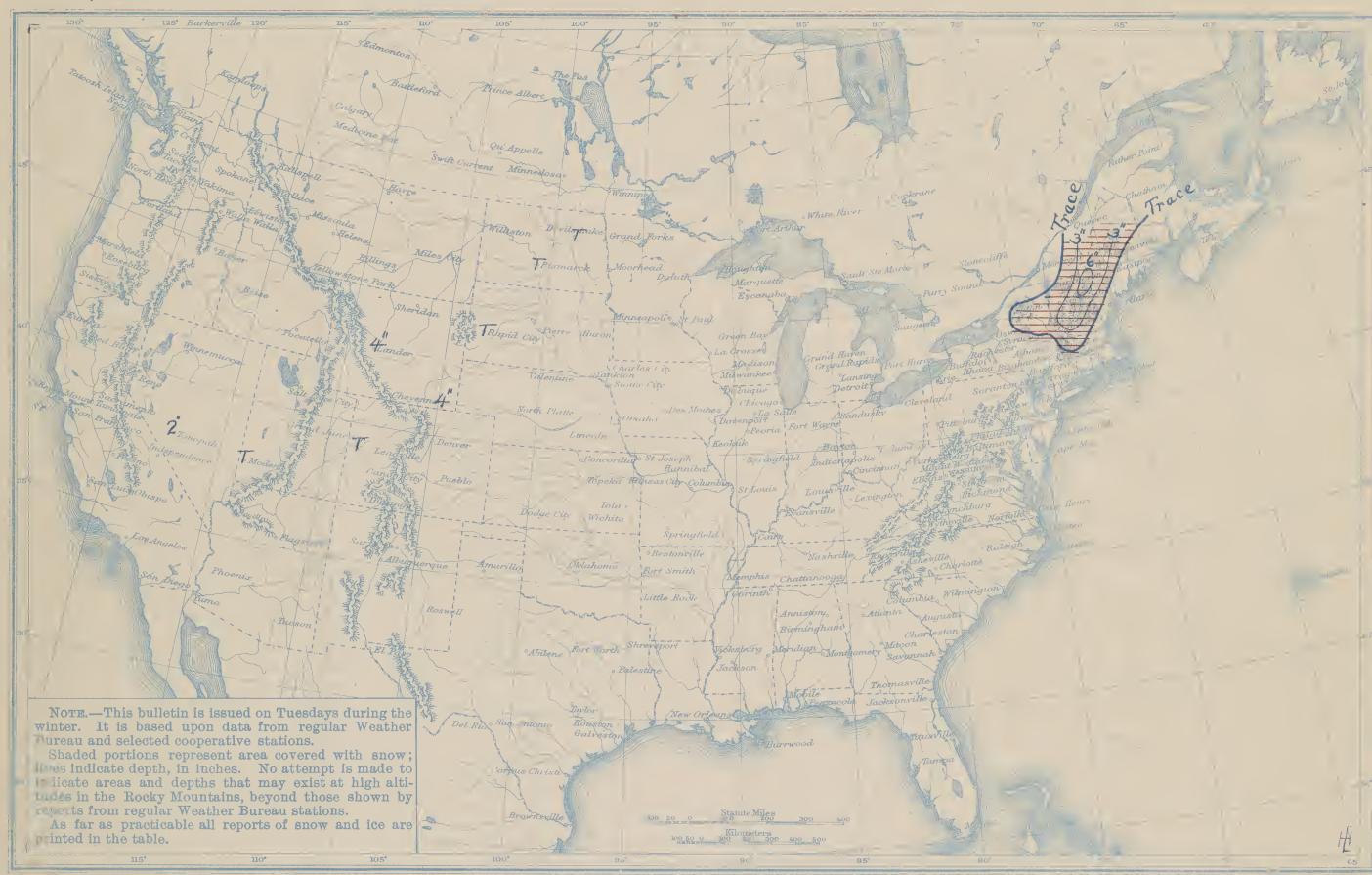


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DETROIT
DEC 15 1913
SNOW AND ICE BULLETIN

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., December 2, 1913.

DEPTH OF SNOW.

The severe storm that visited the Great Lakes region from about November 8th to 10th caused some remarkably heavy falls of snow, especially in the vicinity of Lakes Erie and Huron and the headwaters of the Ohio River. The unusually thick and blinding snowfall over the Lakes during this storm impeded navigation and probably contributed much to the severe loss of life and destruction of marine property that occurred. Snow fell to the depth of a foot or more at points in the lower Lake region, and as much as 3 feet was reported in the mountain portions of West Virginia; this soon disappeared, however, under the influence of the warm weather and rain that soon followed.

Aside from the snow that occurred during the above period but little fell during the month in any portion of the country, and on December 1 the ground was free from snow and frost in all portions save over small areas in northern New York, the interior of New England, and at points in the central Rocky Mountain and southern Plateau regions.

Little snow has accumulated as yet in the mountain regions of the West, save possibly in some of the higher ranges.

At the same time last year similar conditions prevailed, except that some small amounts covered the ground in the Lake Superior region, which at this writing is bare.

ICE IN RIVERS AND HARBORS.

The moderate temperatures that prevailed throughout November, especially during the latter portion, prevented the formation of any appreciable ice, and at the beginning of winter the streams and lakes throughout the country are open and navigation continues uninterrupted. Similar conditions prevailed at the same period last year, but in 1911 ice to the thickness of 5 to 10 inches had formed in some of the more northern streams.

The following special report has been received:

Albany, N. Y., December 2.—There is no snow in the Mohawk Valley, but in the Hudson, in the vicinity of Corinth and Thurman, the snow averages 2 inches deep. No ice is reported in either river.

P. C. DAY, Climatologist and Chief of Division.

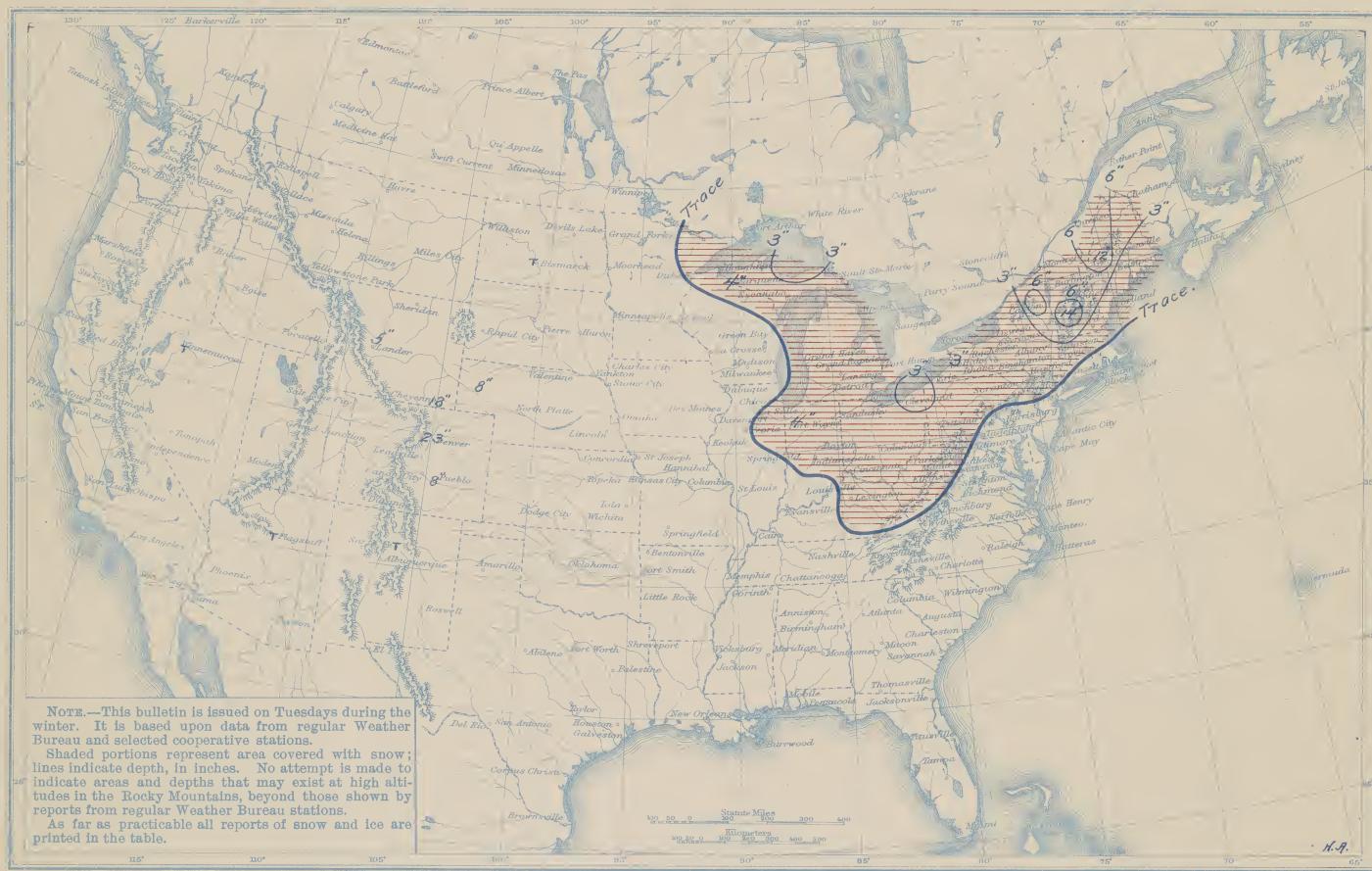
DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., DECEMBER 1, 1913.

| Stations. | Snow. | Ice in rivers, har- bors, etc. | Stations. | Snow. | Ice in rivers, har- bors, etc. | Stations. | Snow. | Ice in rivers, har- bors, etc. |
|-------------------|--------|--------------------------------------|----------------|--------|--------------------------------------|------------------|--------|--------------------------------------|
| Colorado. | Inches | Inches | Nevada. | Inches | Inches | N. Dak.—Cont'd. | Inches | Inches |
| Grand Junction... | T. | ..... | Tonopah..... | 2 | ..... | Devils Lake..... | T. | ..... |
| Maine. | | | New Hampshire. | | | Williston..... | 0 | † |
| Cornish..... | 2 | ..... | Bethlehem..... | 6 | ..... | South Dakota. | | |
| Greenville..... | 3 | 0.0 | Durham..... | T. | ..... | Rapid City..... | T. | |
| Lewiston..... | T. | 0.0 | Hanover..... | 2 | ..... | Utah..... | | |
| Millinocket..... | 2 | ..... | Keene..... | 3 | ..... | Modena..... | T. | |
| Ven Buren..... | 1 | ..... | New York. | | | Vermont..... | | |
| Massachusetts. | | | Corinth..... | 2 | ..... | Brattleboro..... | 3 | 0.0 |
| Adams..... | 3 | ..... | Thurman..... | 2 | ..... | Northfield..... | 2 | ..... |
| Amherst..... | T. | ..... | North Dakota. | | | Wyoming..... | 4 | ..... |
| Fitchburg..... | 2 | ..... | Bismarck..... | T. | † | Cheyenne..... | 4 | ..... |
| | | | | | | Lander..... | 4 | ..... |

† Floating ice.

T. indicates trace.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., December 9, 1913.

DEPTH OF SNOW.

During the week just ended snow prevailed more or less continuously for several days in the southern and middle Rocky Mountain regions, the storm culminating over Colorado during the 5th and 6th with unusually heavy falls. At Denver a total depth of nearly 4 feet occurred and doubtless the amounts were much greater in the higher mountains. The previous continuation of mild weather had permitted many persons to remain in the mountain districts unprepared for such a severe storm. Reports indicate that as a result a large number of lives were lost from exposure to cold and from lack of food. Traffic of all kinds was seriously delayed and communication with the remoter districts has been entirely cut off.

During the 6th and 7th the storm moved rapidly from the Great Plains to the Lake region developing considerably in intensity, but without snowfall, except in the vicinity of the Great Lakes. Thence it moved to the St. Lawrence Valley, accompanied by general rains over most eastern districts, turning to snow in the upper Ohio Valley, western Pennsylvania, and thence northeastward over New York and New England. At the 8 p. m. observation of Monday small amounts of snow covered the ground in the Lake region and generally over the upper Ohio drainage, the amounts increasing northward to 6 or more inches in northern New York, and to 12 inches or more at points in the interior of New England.

In the Middle Rocky Mountains the depths at the lower elevations in Colorado, Wyoming and western Nebraska range from 5 to more than 20 inches and at the high elevations they are doubtless much greater.

Over other portions of the mountain regions of the West it is probable that little snow fell during the week.

ICE IN RIVERS AND HARBOURS.

The further continuation of moderate temperatures during much of the past week over the districts from the Rocky Mountains eastward, again prevented the formation of any appreciable amount of ice on the rivers and lakes, save at a few points in the more northern districts. A thickness of one inch is reported on the James River at Huron, S. Dak., and some floating ice is reported in the Missouri River, elsewhere the streams and harbors are open and navigation is uninterrupted.

The following special reports have been received:

Hartford, Conn., December 9.—In Massachusetts and Connecticut the Connecticut Valley is bare of snow. In southern Vermont reports show depths increasing northward, White River Junction having 14 inches.

Albany, N. Y., December 9.—In the Hudson Valley the depth of snow ranges from a trace at Coxsackie to 3 inches at Thurman; in the Mohawk Valley it averages 1 inch. No ice is reported in either river.

Binghamton, N. Y., December 9.—The average depth of snow in the Unadilla and upper Susquehanna valleys is 1 inch, and in the Chenango and Tioughnioga valleys 2 inches.

Yankton, S. Dak., December 8.—The pontoon bridge in the Missouri River was removed to-day. This is the latest date of removal for a number of years.

P. C. DAY, *Climatologist and Chief of Division.*

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., DECEMBER 8, 1913.

| Stations. | Snow. | Ice in rivers har- bors, etc. | Stations. | Snow. | Ice in rivers har- bors, etc. | Stations. | Snow. | Ice in rivers har- bors, etc. |
|----------------|--------|-------------------------------------|------------------|--------|-------------------------------------|------------------|--------|-------------------------------------|
| Arizona. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | Ohio—Cont'd. | Inches | Inches |
| Flagstaff | T. | | Ludington | T. | 0.0 | Tiffin | 2 | |
| Colorado. | | | Mackinaw | 1 | | Toledo | 0.0 | |
| Denver | 23 | | Manistee | 2 | | Wauseon | 1 | |
| Pueblo | 8 | | Marquette | 4 | 0.0 | Waverly | | |
| Illinois. | | | Newberry | 3 | | Youngstown | 1 | |
| Bloomington | T. | | Port Huron | 1 | 0.0 | Pennsylvania. | | |
| Danville | T. | | Sault Ste. Marie | 1 | 0.0 | Clarion | 1 | |
| Joliet | T. | | South Haven | T. | | Drift | | |
| Indiana. | | | Duluth | T. | 0.0 | Emporium | T. | |
| Bloomington | T. | | St. Paul | 0 | * | Franklin | 2 | |
| Fort Wayne | 1 | | Nebraska. | | | Greenville | 3 | |
| Indianapolis | T. | | Alliance | 8 | | Hyndman | | |
| Knox | 4 | | Nevada. | | | Indiana | 1 | |
| La Fayette | T. | | Winnebucca | T. | | Johnstown | 2 | |
| Marion | T. | | New Hampshire. | | | Lawrenceville | T. | |
| Winona Lake | 2 | | Bethlehem | 3 | | Meadville | 2 | |
| Iowa. | | | Hanover | 14 | | Parkers Landing | 1 | |
| Albia | T. | | Keene | 6 | | Pittsburgh | | 0.0 |
| Kentucky. | | | New Jersey | | | Salisbury | | |
| Beattyville | 1 | | Newton | T. | | Seranton | | |
| Greensburg | T. | | New Mexico. | | | Somerset | 1 | |
| Maysville | T. | | Williamsburg | T. | | Towanda | T. | |
| Williamsburg | T. | | Maine. | | | Warren | 2 | |
| Michigan. | | | Cornish | T. | | South Dakota. | | |
| Gardiner | 1 | 0.0 | Binghamton | 1 | | Huron | 0 | 1.0 |
| Greenville | 12 | 0.0 | Bouckville | 1 | | Pierre | 0 | * |
| Lewiston | 3 | 0.0 | Buffalo | 3 | 0.0 | Yankton | 0 | * |
| Millinocket | 1 | | Cooperstown | 2 | | Vermont. | | |
| Portland | T. | 0.0 | Ithaca | T. | | Bellows Falls | 6 | |
| Van Buren | 2 | | Lake Placid | 6 | | Brattleboro | 3 | 0.0 |
| Massachusetts. | | | Lowville | 2 | | Northfield | 5 | |
| Adams | 3 | | Malone | 4 | | St. Johnsbury | 2 | |
| Boston | T. | | Oswego | T. | 0.0 | White River June | 14 | |
| Fitchburg | 1 | | Oxford | 2 | | Virginia. | | |
| Mansfield | T. | | Rome | 1 | | Wytheville | | |
| Nantucket | T. | 0.0 | Saranac Lake | 6 | | West Virginia. | | |
| Michigan. | | | Syracuse | 1 | | Bayard | 4 | |
| Alpena | 2 | 0.0 | Warwick | T. | | Elkhorn | 1 | |
| Ann Arbor | 1 | | Watertown | 1 | | Elkins | 2 | 0.0 |
| Big Rapids | T. | | North Dakota. | | | Paiment | 1 | |
| Chatham | T. | | Bismarck | T. | 0.0 | Glenville | 2 | |
| Detroit | 2 | | Williston | 6 | * | Parkersburg | T. | 0.0 |
| Escanaba | T. | 0.0 | Ohio. | | | Wisconsin. | | |
| Grand Haven | 2 | | Ashland | 1 | | Green Bay | 0 | * |
| Grand Rapids | T. | | Cincinnati | T. | 0.0 | Koepenick | 1 | |
| Harrisville | 1 | | Cleveland | 3 | 0.0 | Wyoming. | | |
| Iron Mountain | T. | | New Bremen | 1 | | Cheyenne | 18 | |
| Ironwood | 4 | | Sandusky | T. | 0.0 | Lander | 5 | |

*Shore ice. † Floating ice. T. indicates trace.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.

CHARLES F. MARVIN, CHIEF.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., December 16, 1913.

DEPTH OF SNOW.

With the exception of a slight barometric depression that passed from the Lake region to the New England coast during the 10th and 11th the week was singularly free from atmospheric disturbances usual at this season of the year.

The pressure remained high throughout the week over the southeastern districts and clear skies, with warm southerly winds, were the dominant weather conditions over all central and northern districts from the Great Plains eastward. Likewise high pressure, with generally clear skies and moderately cool weather, prevailed over the central Rocky Mountain region during most of the week. Conditions were therefore unfavorable for precipitation, and but little rain or snow occurred over any portion of the country, save in Texas and portions of the middle Gulf States, and along the immediate Pacific coast. Small amounts of snow occurred about the 10th and 11th over the northeastern districts, but elsewhere there appears to have been little or none, and such as was on the ground last week over the Lake region, Ohio Valley, and northeastern districts has largely disappeared.

At the present time no appreciable snow covers the ground to eastward of the Rocky Mountains, save in extreme northern New York and over the interior of New England. In the middle Rocky Mountain districts the heavy covering of snow from the storm of the preceding week remained largely unmelted, except at the lower levels where the depth is several inches less than last week. Elsewhere over the Mountain and Plateau districts there is little or no snow at the lower elevations and no additions appear to have been made to the amounts in the high ranges.

ICE IN RIVERS AND HARBORS.

The moderate cold wave at the first of the week over eastern and southern districts quickly dissipated, and during the remainder of the week temperatures were generally near normal or above over all central and northern districts from the Great Plains region eastward. As a result, no appreciable amounts of ice formed in any of the streams or lakes, save in the upper Missouri Valley, where at points it is several inches thick, and in the Lake Superior region and northern New England, where some shore ice is reported.

At the same time last year there was likewise but little ice, save over the extreme northern portions of the country, where the thickness was considerably in excess of the amounts reported this year.

With the continuation of mild weather navigation is still uninterrupted at the middle of the month.

The following special reports have been received:

Hartford, Conn., December 16.—In the Connecticut Valley there appears to be no snow to southward of the southern portions of Vermont and New Hampshire; but to the northward amounts ranging up to 4 inches are reported. The river is frozen from Brattleboro, Vt., northward.

Albany, N. Y., December 16.—There is no snow in either the Hudson or the Mohawk Valley, except for 1 inch of snow in the valley of West Canada Creek. No ice is reported in either river.

P. C. DAY, Climatologist and Chief of Division.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., DECEMBER 15, 1913.

| Stations. | Show. | Ice in rivers, har- bors, etc. | Stations. | Show. | Ice in rivers, har- bors, etc. | Stations. | Show. | Ice in rivers, har- bors, etc. |
|-----------------|--------|--------------------------------------|-----------------------|--------|--------------------------------------|--------------------|--------|--------------------------------------|
| Arizona. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | Pennsylvania. | Inches | Inches |
| Flagstaff..... | T. | ..... | Ironwood..... | T. | 0 | Towanda..... | T. | ..... |
| Colorado. | | | Marguerite..... | 0 | * | Warren..... | T. | ..... |
| Denver..... | 15 | ..... | Newberry..... | 1 | | South Dakota. | | |
| Durango..... | T. | ..... | Sault Ste. Marie..... | T. | 0.0 | Huron..... | 0 | 3.5 |
| Pueblo..... | 5 | ..... | Minnesota. | | | Pierre..... | 0 | † |
| Connecticut. | | | Duluth..... | 0 | * | Yankton..... | 0 | † |
| West Cornwall. | T. | ..... | Moorhead..... | 0 | * | Vermont. | | |
| Idaho. | | | Nebraska. | | | Bellows Falls..... | T. | ..... |
| Lewiston..... | 0 | * | Alliance..... | 4 | | Brattleboro..... | 0 | 1.0 |
| Kansas. | | | Imperial..... | 1 | | Lyndonville..... | 2 | |
| Wallace..... | 2 | ..... | Nevada. | | | Northfield..... | 1 | |
| Maine. | | | Tonopah..... | T. | | St. Johnsbury..... | 4 | |
| Cornish..... | T. | * | New Hampshire. | | | White River Junc. | | |
| Gardiner..... | T. | * | Bethlehem..... | 4 | | West Virginia. | | |
| Greenville..... | 7 | 0.0 | Hanover..... | 6 | | Bayard..... | T. | |
| Lewiston..... | T. | * | Keene..... | 2 | | Elkins..... | T. | 0.0 |
| Van Buren..... | 10 | ..... | New Mexico. | | | Fairmont..... | T. | |
| Maryland. | | | Santa Fe..... | T. | | Wisconsin. | | |
| Oakland..... | T. | ..... | New York. | | | Green Bay..... | 0 | * |
| Michigan. | | | Lake Placid..... | 4 | | Wyoming. | | |
| Alpena..... | T. | 0.0 | North Dakota. | | | Cheyenne..... | 12 | |
| Chatham..... | T. | ..... | Bismarck..... | T. | † | Lander..... | 3 | |
| Escanaba..... | T. | 0.0 | Williston..... | 0 | 3.0 | | | |
| Iron River..... | T. | ..... |  |  |  |  |  |  |

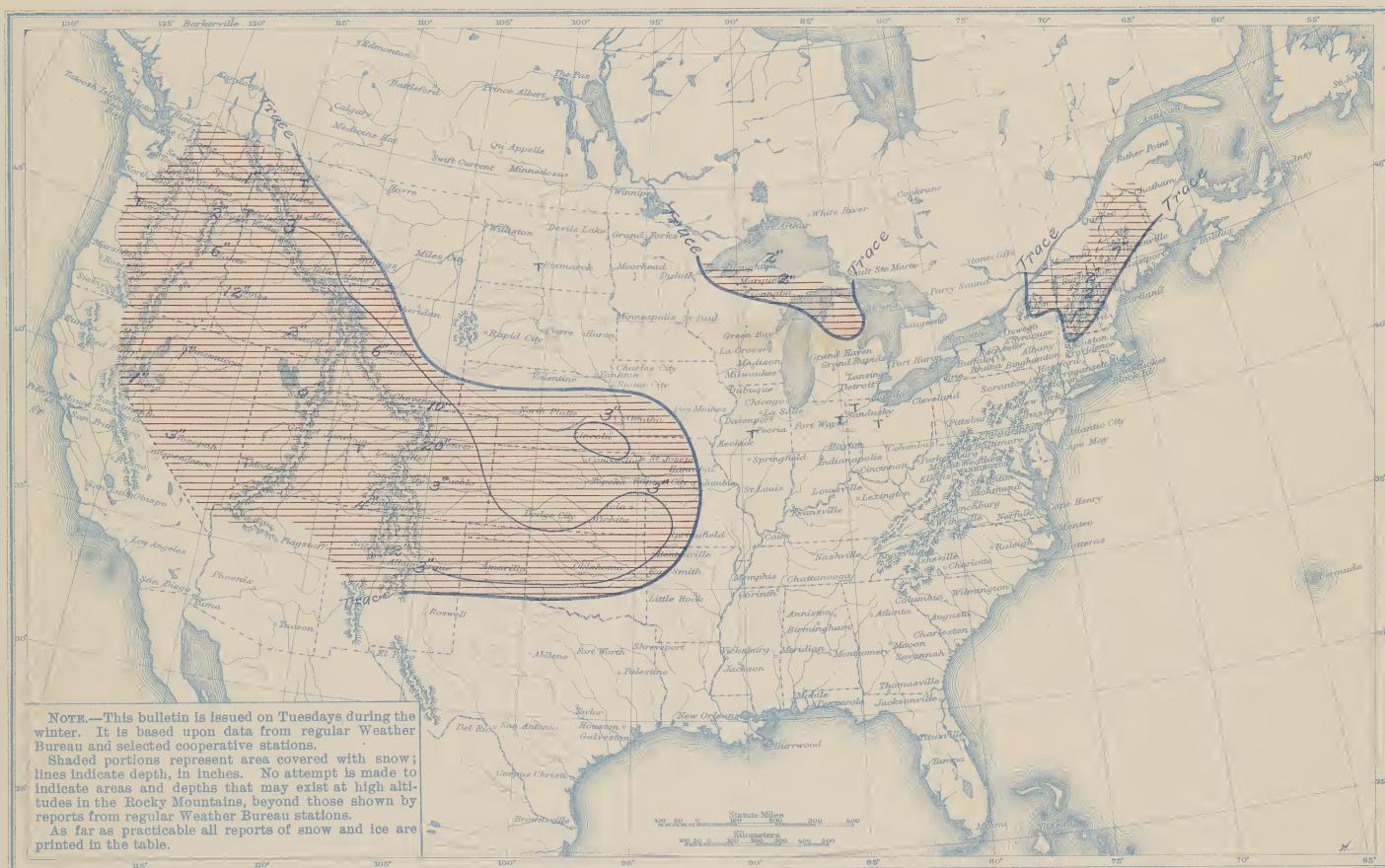
* Shore ice. † Floating ice. T. indicates trace.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.

CHARLES F. MARVIN, CHIEF.

SNOW AND ICE BULLETIN.

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U. S. DEPARTMENT OF AGRICULTURE
WEATHER BUREAU



WASHINGTON, D. C., December 23, 1913.

DEPTH OF SNOW.

Generally fair weather prevailed during the first half of the week over the districts where snow usually occurs at this season of the year, and the ground generally continued bare. During the latter part of the week the weather was somewhat unsettled and light local snow or rain occurred at many points from the middle Rocky Mountains eastward and over portions of the Pacific coast States. At this writing unsettled weather prevails over all districts from the middle and southern Plains region eastward, with very general rains in the Ohio Valley, east Gulf States, and over the Atlantic coast to southward of New England, while more or less snow is falling from the middle Mississippi Valley eastward to the Lake region, and local snows are likewise prevailing at points in the mountain regions of the West.

At 8 p.m. Monday, the 22d, there was practically no snow on the ground over the entire region from the Mississippi Valley eastward, save for slight amounts in the upper Lake region and extreme northern New York and the interior of New England. The ground was likewise bare throughout nearly the entire middle and upper Missouri Valley.

In the middle Plains region some snow had accumulated during the week, and at the close depths of from 3 to 5 inches covered the ground at points in the Panhandle region of Texas, and extended over Oklahoma into northwestern Arkansas, southwestern Missouri and southeastern Kansas. Considerable snow accumulated during the week in the mountain regions of the West, the additions amounting to from 2 inches to about 1 foot at the lower levels, and doubtless more has fallen at the high elevations.

ICE IN RIVERS AND HARBORS.

While moderately warm weather for the season continued during the week throughout much of the country to eastward of the Rocky Mountains, the temperatures along the extreme northern border were sufficiently low to cause the formation of considerable ice, even in the larger streams. In the upper Missouri a thickness of 14 inches is reported at Williston, N. Dak., an increase during the week of nearly 1 foot, but throughout the middle portion only floating or shore ice is reported, while the lower portion of the river is entirely free from ice.

In the Mississippi some shore or floating ice is reported in the upper reaches, but elsewhere the river continues free of ice.

In the Lake region small amounts of ice have formed in some of the protected localities of the upper Lakes, but most of the harbors are still open and navigation is uninterrupted.

In New England rather cool weather on several dates favored the formation of ice, and at points in the interior of Maine it is now nearly 1 foot in thickness.

The following special reports have been received:

Hartford, Conn., December 23.—In the Connecticut Valley the ground is bare of snow from Bellows Falls, Vt., southward, while in the upper portion the depths have decreased during the last week. The ice in the middle and upper portions of the river has increased in thickness.

Albany, N. Y., December 23.—There is no snow in either the Hudson or the Mohawk Valley. In portions of the upper Hudson and upper Mohawk rivers there is ice 1 inch thick.

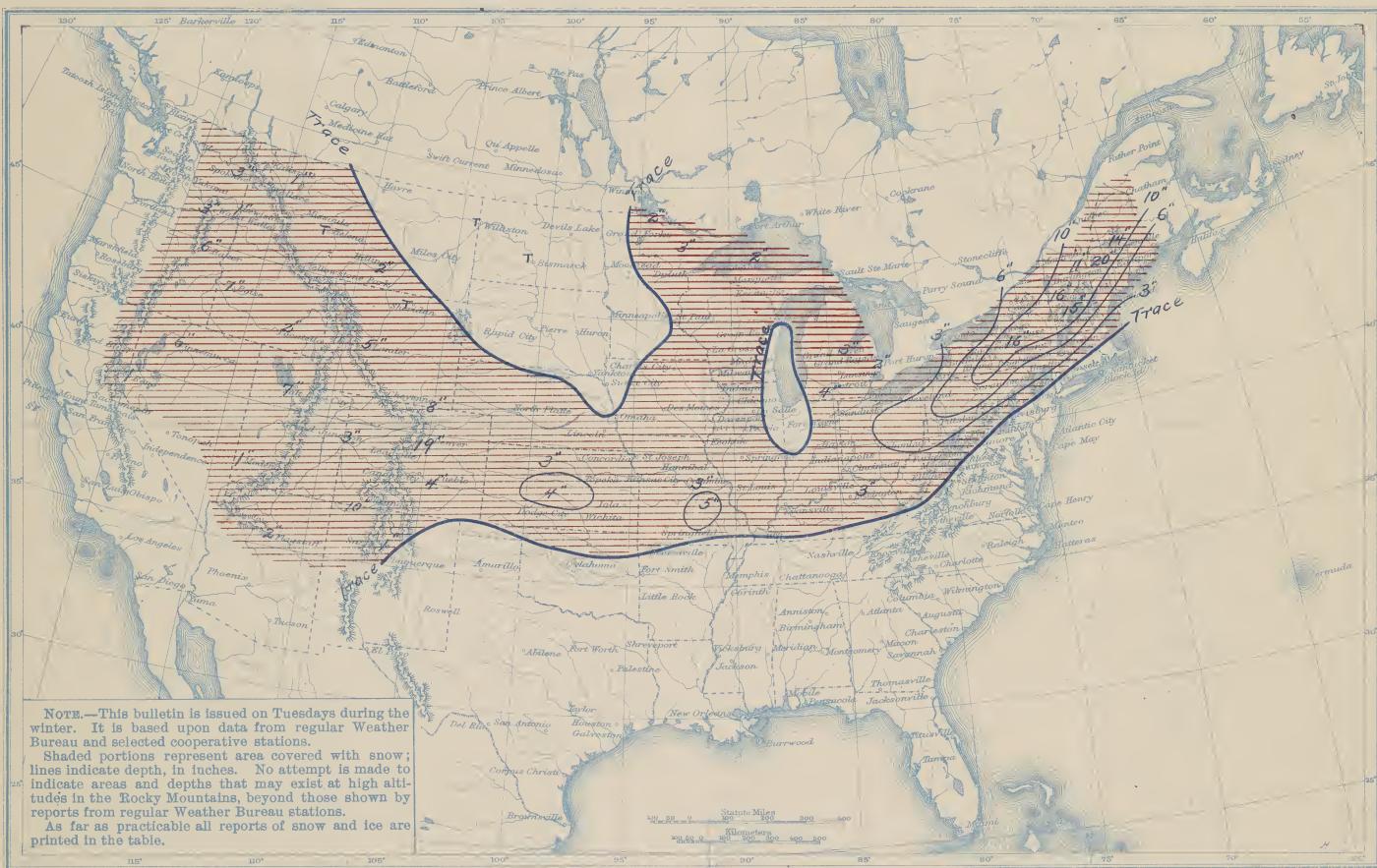
P. C. DAY, Climatologist and Chief of Division.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., DECEMBER 22, 1913.

| Stations. | Show. | Ice in rivers, harbors, etc. | Stations. | Show. | Ice in rivers, harbors, etc. | Stations. | Show. | Ice in rivers, harbors, etc. |
|---------------------|--------|------------------------------|-----------------------|--------|------------------------------|---------------------|--------|------------------------------|
| Arkansas. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | New York. | Inches | Inches |
| Bentonville..... | 3 | ..... | Escanaba..... | T. | * | Lake Placid..... | 4 | ..... |
| Fort Smith..... | 2 | 0.0 | Harrisville..... | T. | 1 | Rochester..... | T. | 0.0 |
| Colorado. | ..... | ..... | Houghton..... | T. | 1.5 | North Dakota. | ..... | ..... |
| Denver..... | 20 | ..... | Iron Mountain..... | T. | ..... | Bismarck..... | ..... | ..... |
| Durango..... | 4 | ..... | Iron River..... | T. | ..... | Williston..... | T. | 0 |
| Grand Junction..... | T. | ..... | Marquette..... | 2 | 0.0 | Tiffin..... | T. | ..... |
| Pueblo..... | 3 | ..... | Port Huron..... | 0 | 2.0 | Wauseon..... | T. | ..... |
| Idaho. | ..... | ..... | Saginaw..... | 0 | * | Oklahoma..... | 3 | ..... |
| Boise..... | 12 | ..... | Sault Ste. Marie..... | 1 | * | Oklahoma..... | 3 | ..... |
| Lewiston..... | T. | * | Minnesota. | ..... | ..... | Oregon..... | ..... | ..... |
| Pocatello..... | 2 | ..... | Moorhead..... | 0 | * | Baker..... | 6 | ..... |
| Illinois. | ..... | ..... | St. Paul..... | 0 | * | Portland..... | T. | 0.0 |
| Joliet..... | T. | ..... | Missouri. | ..... | ..... | Pennsylvania. | ..... | ..... |
| Monmouth..... | 2 | ..... | Columbia..... | 2 | ..... | Erie..... | 0 | * |
| Peoria..... | T. | 0.0 | Kansas City..... | 1 | 0.0 | South Dakota. | ..... | ..... |
| Indiana. | ..... | ..... | Springfield..... | 4 | ..... | Huron..... | 0 | 6.5 |
| Fort Wayne..... | T. | ..... | Montana. | ..... | ..... | Pierre..... | 0 | * |
| Iowa. | ..... | ..... | Des Moines..... | 3.0 | ..... | Yankton..... | 0 | * |
| Des Moines..... | T. | 3.0 | Billings..... | T. | ..... | Texas. | ..... | ..... |
| Dubuque..... | 0 | † | Helena..... | 3 | ..... | Amarillo..... | 5 | ..... |
| Sioux City..... | 0 | * | KalisPELL..... | T. | ..... | Utah. | ..... | ..... |
| Kansas. | ..... | ..... | Nebraska. | ..... | ..... | Modena..... | ..... | ..... |
| Concordia..... | T. | ..... | Auburn..... | 3 | ..... | Salt Lake City..... | 5 | ..... |
| Dodge City..... | 1 | ..... | Imperial..... | 2 | ..... | Vermont. | ..... | ..... |
| Ellinwood..... | T. | ..... | Lincoln..... | 1 | ..... | Brattleboro..... | 0 | 2.5 |
| Iola..... | 4 | 0.0 | North Platte..... | 1 | ..... | Lyndonville..... | T. | ..... |
| Medicine Lodge..... | 2 | ..... | Oakdale..... | 1 | ..... | Northfield..... | T. | ..... |
| Topeka..... | 1 | ..... | Omaha..... | T. | † | St. Johnsbury..... | T. | ..... |
| Wichita..... | 2 | ..... | York..... | 3 | ..... | Well River..... | T. | ..... |
| Maine. | ..... | ..... | Nevada. | ..... | ..... | White River Junc. | 1 | ..... |
| Bangor..... | 0 | 2.0 | Reno..... | 1 | 0.0 | Washington. | ..... | ..... |
| Cornish..... | T. | ..... | Tonopah..... | 3 | ..... | Spokane..... | 1 | ..... |
| Gardiner..... | 0 | * | Winnemucca..... | 1 | ..... | Walla Walla..... | 2 | ..... |
| Greenville..... | 7 | 11.0 | New Hampshire. | ..... | ..... | Wisconsin. | ..... | ..... |
| Lewiston..... | T. | * | Bethlehem..... | 2 | ..... | Green Bay..... | 0 | 0.5 |
| Millinocket..... | 2 | ..... | Hanover..... | 3 | ..... | La Crosse..... | 0 | * |
| Massachusetts. | ..... | ..... | Keene..... | T. | ..... | Cheyenne..... | 10 | ..... |
| Adams..... | T. | ..... | Lancaster..... | 2 | ..... | Lander..... | 6 | ..... |
| Michigan. | ..... | ..... | New Mexico. | ..... | ..... | Yellowstone Park. | T. | ..... |
| Cadillac..... | 1 | ..... | Santa Fe..... | 2 | ..... | ..... | ..... | ..... |
| Calumet..... | 2 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

*Shore ice. † Floating ice. T. indicates trace.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., December 30, 1913.

DEPTH OF SNOW.

The principal snowfall for the week just ended occurred in connection with a storm that moved from the Gulf region to the Middle Atlantic States on Christmas day, thence to New England within the following 24 hours.

Heavy rain was general during that storm over portions of the east Gulf and Atlantic coast States, while snow fell to a greater or less extent over all northern districts from the Mississippi Valley eastward. The amounts were mostly light, however, save from central Pennsylvania northward to the interior of New England, where the amounts were locally heavy. In portions of northern New York the fall amounted to a foot or more, and the high winds drifted it so badly that roads became impassable and transportation business was seriously delayed.

Over most other portions of the country snowfall was extremely light, except in portions of the Mountain and Plateau regions where locally the accumulations amounted to several inches. A considerable portion of the snow that covered the middle Plains regions last week has disappeared, although the ground still has a light covering.

But little snow has yet accumulated in the upper Lake region, where, at this period of the year, the ground is usually heavily covered. Likewise in the Missouri Valley the ground is almost entirely bare.

In the mountain regions of the West there appears to have been a fair amount of snowfall so far this season, and the depths stored at the high elevations are now probably in excess of those of last year, and in some places probably above the average, especially in the middle and southern Rocky Mountain regions.

ICE IN RIVERS AND HARBORS.

Although no severe cold occurred over the northern districts during the week just ended, the temperature continued sufficiently low to cause the formation of considerable ice in addition to that reported last week. The Missouri River appears to be generally closed from Sioux City northward, and ice is reported gorged at Omaha, but no appreciable ice has formed in the lower portions of the river.

In the Mississippi River drainage system shore or floating ice is reported from Keokuk northward, and in the smaller tributaries of both the upper Missouri and the upper Mississippi the ice has attained a thickness in places of from 6 to 10 inches.

In the Lake region ice continued to form in the more protected harbors, but the increase during the week was relatively small.

In New England there was a very general and relatively large increase in the amount of ice over that reported last week, the streams and lakes of the interior portions now being covered with from 6 to 12 inches of ice. No appreciable amounts of ice have yet formed on the main streams of the Ohio Valley system or of the middle Atlantic coast.

The following special reports have been received:

Hartford, Conn., December 30.—There has been a great increase in both depth of snow and thickness of ice in the upper Connecticut Valley.

Albany, N. Y., December 30.—The snow in the Hudson Valley ranges in depth from 5 inches at Athens to 12 at Thurman; in the Mohawk Valley it averages 5 inches deep. The ice in the Hudson and Mohawk rivers averages 2 inches thick.

Binghamton, N. Y., December 30.—The snow in the upper Susquehanna Valley averages 6 inches deep, in the Unadilla, 10; in the Chenango, 8; and in the Tioughnioga, 7. The greatest depth reported from this whole region is 16 inches at Waterville, N. Y.

Sioux City, Iowa, December 29.—The channel of the Missouri River here is practically closed by ice.

P. C. DAY, Climatologist and Chief of Division.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., DECEMBER 29, 1913.

| Stations. | Show. | Ice in rivers, har- bors, etc. | Stations. | Show. | Ice in rivers, har- bors, etc. | Stations. | Show. | Ice in rivers, har- bors, etc. |
|-----------------|--------|--------------------------------------|----------------------|--------|--------------------------------------|------------------|--------|--------------------------------------|
| Arizona. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | North Dakota. | Inches | Inches |
| Flagstaff. | 2 | ..... | Detroit. | T. | 0.0 | Bismarck. | T. | 6.0 |
| Arkansas. | ..... | ..... | Escanaba. | T. | * | Williston. | T. | 15.5 |
| Bentonville. | 1 | ..... | Grand Haven. | T. | ..... | Ohio. | ..... | ..... |
| Colorado. | ..... | ..... | Grand Rapids. | T. | ..... | Ashland. | 5 | ..... |
| Denver. | 19 | ..... | Harrisville. | 1 | ..... | Cadiz. | 4 | ..... |
| Durango. | 10 | ..... | Houghton. | T. | 3.5 | Canton. | 4 | ..... |
| Grand Junction. | 3 | ..... | Ironwood. | 1 | ..... | Cincinnati. | T. | 0.0 |
| Pueblo. | 4 | ..... | Ludington. | T. | * | Cochetown. | 1 | ..... |
| Connecticut. | ..... | ..... | Mackinaw. | 1 | ..... | Cleveland. | T. | 0.0 |
| Hartford. | T. | † | Mancelona. | 1 | ..... | Dayton. | T. | ..... |
| Idaho. | ..... | ..... | Manistee. | 1 | ..... | Hiram. | 8 | ..... |
| Boise. | 7 | ..... | Marquette. | 2 | 0.0 | Marion. | 1 | ..... |
| Lewiston. | 1 | 0.0 | Newberry. | 1 | ..... | Philo. | 4 | ..... |
| Pocatello. | 2 | ..... | Port Huron. | 2 | 3.0 | Sandusky. | 1 | 1.0 |
| Illinois. | ..... | ..... | Rock. | 4 | ..... | Tiffin. | 2 | ..... |
| Charleston. | T. | ..... | Saginaw. | 3 | 4.5 | Toledo. | T. | ..... |
| Dwight. | 2 | ..... | Sault Ste. Marie. | 1 | * | Wauseon. | 1 | ..... |
| Joliet. | 1 | ..... | Duluth. | 1 | 4.0 | Youngstown. | 2 | ..... |
| Monmouth. | 2 | ..... | Fort Ripley. | T. | ..... | Oregon. | ..... | ..... |
| Olney. | 1 | ..... | Hinckley. | 1 | ..... | Baker. | 6 | ..... |
| Peoria. | 1 | 0.0 | International Falls. | 2 | ..... | Pennsylvania. | ..... | ..... |
| Springfield. | T. | ..... | Moorhead. | 0 | 6.0 | Center Hall. | 7 | ..... |
| Walnut. | 1 | ..... | St. Paul. | 0 | ..... | Drifton. | 6 | ..... |
| Indiana. | ..... | ..... | Winton. | 3 | ..... | Emporium. | 5 | ..... |
| Bloomington. | T. | ..... | Missouri. | ..... | ..... | Erie. | 2 | * |
| Evansville. | T. | 0.0 | Columbia. | T. | ..... | Franklin. | 4 | ..... |
| Fort Wayne. | T. | ..... | Hannibal. | T. | 0.0 | Greenville. | 3 | ..... |
| Marion. | T. | ..... | Ironton. | 4 | ..... | Harrisburg. | T. | † |
| Paoli. | 1 | ..... | Kansas City. | 1 | 0.0 | Huntingdon. | 2 | ..... |
| Richmond. | T. | ..... | Maryville. | 2 | ..... | Indiana. | 4 | ..... |
| Seymour. | 1 | ..... | Pacific. | 5 | ..... | Johnstown. | 2 | ..... |
| Iowa. | ..... | ..... | St. Louis. | 1 | 0.0 | Lawrenceburg. | 12 | ..... |
| Albia. | T. | ..... | Springfield. | 1 | ..... | Parkers Landing. | 8 | ..... |
| Atlantic. | T. | ..... | Unionville. | 2 | ..... | Pittsburgh. | 4 | 0.0 |
| Charles City. | T. | ..... | Montana. | ..... | Reading. | T. | 0.0 | |
| Davenport. | 1 | † | Billings. | 2 | ..... | Ridgway. | 6 | ..... |
| Des Moines. | T. | 6.0 | Helena. | T. | ..... | Seranton. | 1 | ..... |
| Dubuque. | 0 | †* | Kalispell. | 1 | ..... | Somerset. | 4 | ..... |
| Forest City. | T. | ..... | Nebula. | 2 | ..... | Towanda. | 8 | ..... |
| Keokuk. | 1 | * | Nebraska. | 1 | ..... | Warren. | 4 | ..... |
| Sioux City. | 0 | * | Auburn. | 2 | ..... | South Dakota. | ..... | ..... |
| Kansas. | ..... | ..... | Broken Bow. | 2 | ..... | Huron. | 0 | 10.5 |
| Concordia. | T. | ..... | Imperial. | 2 | ..... | Pierre. | 0 | * |
| Dodge City. | T. | ..... | Lincoln. | T. | ..... | Utah. | ..... | ..... |
| Ellinwood. | 4 | ..... | North Platte. | T. | ..... | Modena. | 1 | ..... |
| Iola. | 1 | 0.0 | Omaha. | 0 | † | Salt Lake City. | 7 | ..... |
| Manhattan. | 2 | ..... | Reno. | 1 | 0.0 | Vermont. | ..... | ..... |
| Marion. | 5 | ..... | Winnebago. | 6 | ..... | Bellows Falls. | 10 | ..... |
| Medicine Lodge. | 2 | ..... | New Hampshire. | ..... | Brattleboro. | 9 | 10.0 | |
| Topeka. | 2 | ..... | Bethlehem. | 7 | ..... | Burlington. | 8 | 0.0 |
| Wakeeney. | 1 | ..... | Concord. | 8 | 2.0 | Northfield. | 16 | ..... |
| Wichita. | 2 | ..... | Durham. | 4 | ..... | St. Johnsbury. | 10 | ..... |
| Kentucky. | ..... | ..... | Hanover. | 15 | ..... | Wells River. | 12 | ..... |
| Eubank. | 2 | ..... | Keene. | 6 | ..... | Virginia. | ..... | ..... |
| Hopkinsville. | T. | ..... | West Stewartstown. | 11 | ..... | Wytheville. | 1 | ..... |
| Lexington. | 1 | ..... | New Jersey. | ..... | Washington. | ..... | ..... |  |
| Maysville. | T. | ..... | Mount Sterling. | 3 | ..... | Spokane. | 3 | ..... |
| Phillipsburg. | T. | ..... | Maine. | ..... | Walla Walla. | 3 | ..... |  |
| Bangor. | 6 | 5.0 | Santa Fe. | 1 | ..... | West Virginia. | ..... | ..... |
| Cornish. | 16 | ..... | New York. | ..... | Wisconsin. | ..... | ..... |  |
| Eastport. | T. | 0.0 | Albany. | 5 | 2.0 | Green Bay. | 0 | 2.0 |
| Gardiner. | 12 | 6.0 | Binghamton. | 4 | ..... | Hancock. | ..... | ..... |
| Greenville. | 20 | 12.0 | Bouckville. | 11 | ..... | Elkins. | T. | 0.0 |
| Lowell. | 15 | 5.0 | Buffalo. | 2 | 0.0 | Fairmont. | 1 | ..... |
| Millinocket. | 14 | ..... | Canton. | 7 | ..... | Hinton. | T. | ..... |
| Portland. | 4 | 0.0 | Herkimer. | 7 | ..... | Parkersburg. | T. | 0.0 |
| Maryland. | 2 | ..... | Ithaca. | 7 | ..... | Rowlesburg. | 1 | ..... |
| Massachusetts. | ..... | ..... | Malone. | 6 | ..... | Wisconsin. | ..... | ..... |
| Adams. | 6 | ..... | Ogdensburg. | 4 | ..... | Green Bay. | 0 | 2.0 |
| Boston. | T. | ..... | Oswego. | 5 | 1.5 | Hancock. | ..... | ..... |
| Pittsburg. | 6 | ..... | Oxford. | 6 | ..... | Koepnick. | T. | ..... |
| Michigan. | ..... | ..... | Plattsburgh. | 8 | ..... | La Crosse. | T. | 0.0 |
| Alpena. | T. | * | Rochester. | 6 | 4.0 | Madison. | T. | ..... |
| Battle Creek. | 4 | ..... | Rome. | 3 | ..... | Wyoming. | ..... | ..... |
| Cadillac. | 1 | ..... | Saranac Lake. | 8 | ..... | Cheyenne. | 8 | ..... |
| Calumet. | 2 | ..... | Syracuse. | 7 | ..... | Lander. | 5 | ..... |
| | | | Watertown. | 4 | ..... | Sheridan. | T. | ..... |

* Shore ice.

† Floating ice.

‡ Ice gorged.

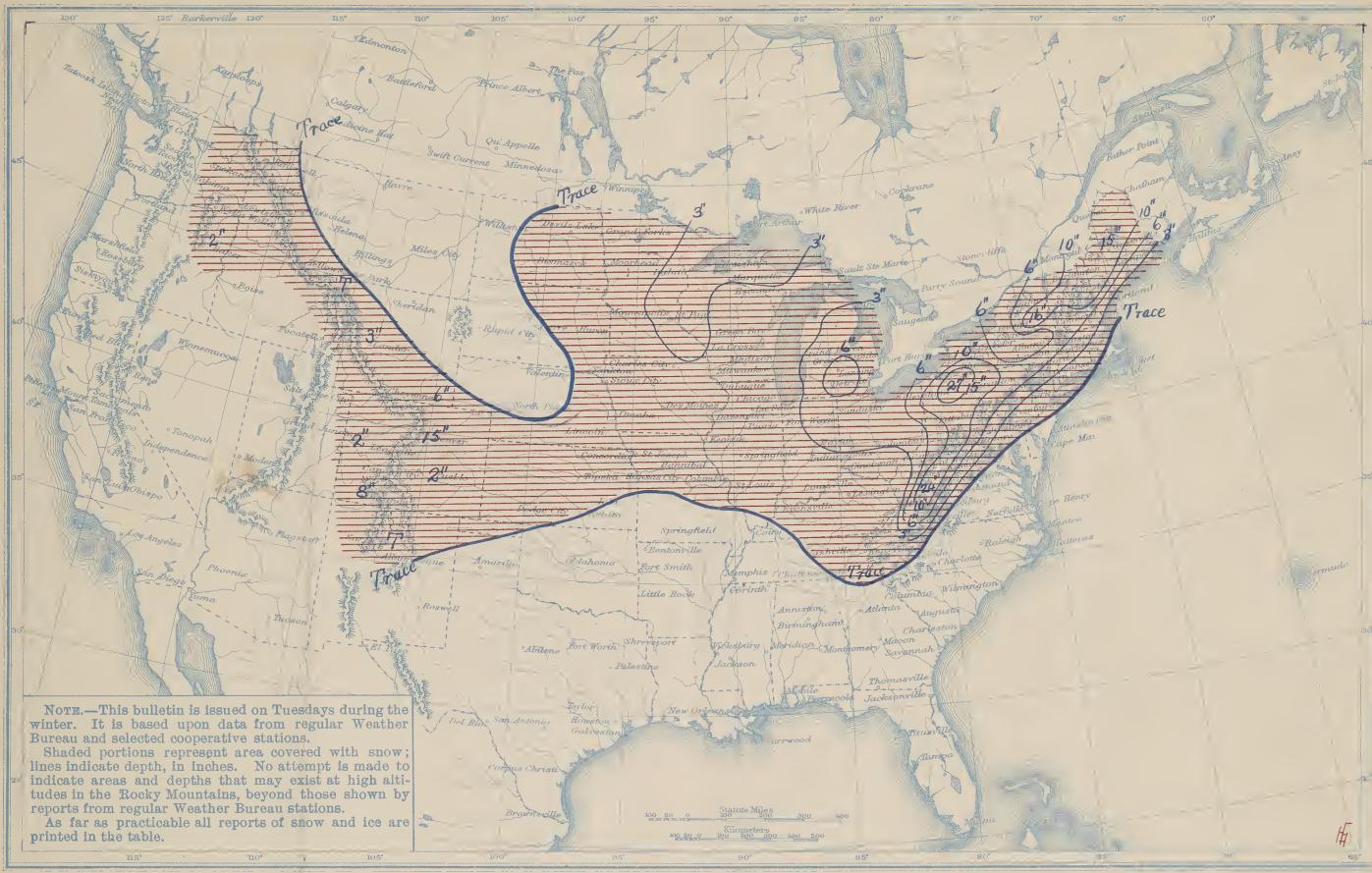
T. indicates trace.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.

CHARLES F. MARVIN, CHIEF.

JAN 21 1914
U. S. DEPARTMENT OF AGRICULTURE
WEATHER BUREAU

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., January 6, 1914.

DEPTH OF SNOW.

The severe storm that overspreads the North Pacific coast at the beginning of the week caused heavy rains at the lower elevations of northern California and the adjoining portions of Oregon and heavy snow in the adjacent mountains.

The storm moved eastward over the northern tier of States, accompanied by light rain or snow, and was central by the middle of the week in the Missouri Valley. By Saturday morning it had moved to the lower Lake region, whence it merged with a widespread storm that had moved from the Southwest and was then central over the middle Atlantic coast, at which time rain or snow was general and in some sections heavy over all districts from the Mississippi Valley eastward, save in New England and northern New York. This storm gradually moved off the southern New England coast by Monday and was accompanied by unusually high winds and heavy seas, causing much damage to property along the coast. During the same time rains continued in the far Northwest, turning to snow at the higher elevations.

During the week just ended a considerable body of snow accumulated in the Appalachian Mountain region from western North Carolina to northern Pennsylvania, and over the northern drainage of the Ohio River, where the snow now ranges from 5 to 15 inches with extreme depths of 2 feet or more at some of the higher elevations. Moderately deep snow still covers the greater part of New York and New England, although there has been some reduction from the amounts reported last week.

In the lower Michigan Peninsula the snow ranges from 2 to 8 inches in depth, and somewhat less is reported from the Lake Superior region and portions of the upper Mississippi Valley. Over much of the upper Lake region, however, and generally over the Mississippi and Missouri valleys there is still little or no snow on the ground.

In the Middle Plains and generally throughout the Rocky Mountain and Plateau regions there was but little snow during the week, and much of that reported last week has disappeared, especially at the lower elevations. Heavy falls appear to have occurred in some of the far western mountains, notably in the Sierra of California and in some of the high elevations of Oregon.

ICE IN RIVERS AND HARBORS.

No severe cold occurred during the week over the northern districts, and only small increases occurred in the thickness of ice heretofore reported, except in a few cases.

In portions of the upper Missouri River considerable additional ice formed, and floating ice is now reported as far south as Kansas City. But little change occurred in the upper Mississippi over the conditions prevailing last week, the river still remaining open for navigation throughout.

In the Lake region small additions occurred at a few points, but many of the harbors are still entirely free of any appreciable ice. In New England there was a very general increase of from 2 to 4 inches in the ice thickness, and similar increases appear in the Hudson and Mohawk rivers. The Ohio and its principal tributaries are still free of ice as are the main streams of the Atlantic coast from the Hudson southward.

The following special reports have been received:

Hartford, Conn., January 6.—The snow in the Connecticut Valley decreased in depth from 1 to 4 inches. The ice in the river is practically unchanged.

Albany, N. Y., January 6.—The snow averages 7 inches deep in the Hudson Valley, the greatest depth reported being 16 inches at Thurman. The snow in the Mohawk Valley averages 3 inches deep. The ice in the Hudson and Mohawk rivers averages 5 inches thick.

Binghamton, N. Y., January 6.—The snow in the Susquehanna Valley averages 4 inches deep, and in the Unadilla, Chenango, and Tioughnioga, 6 inches, the greatest depth reported being 14 inches at Hamilton, N. Y.

Sandusky, Ohio, January 5.—The bay is half covered with soft ice, which probably averages 1 inch thick.

Yankton, S. Dak., January 5.—The Missouri River here has been frozen over since January 2, except a narrow opening in the main channel opposite the city.

P. G. DAY, Climatologist and Chief of Division.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., JANUARY 5, 1914

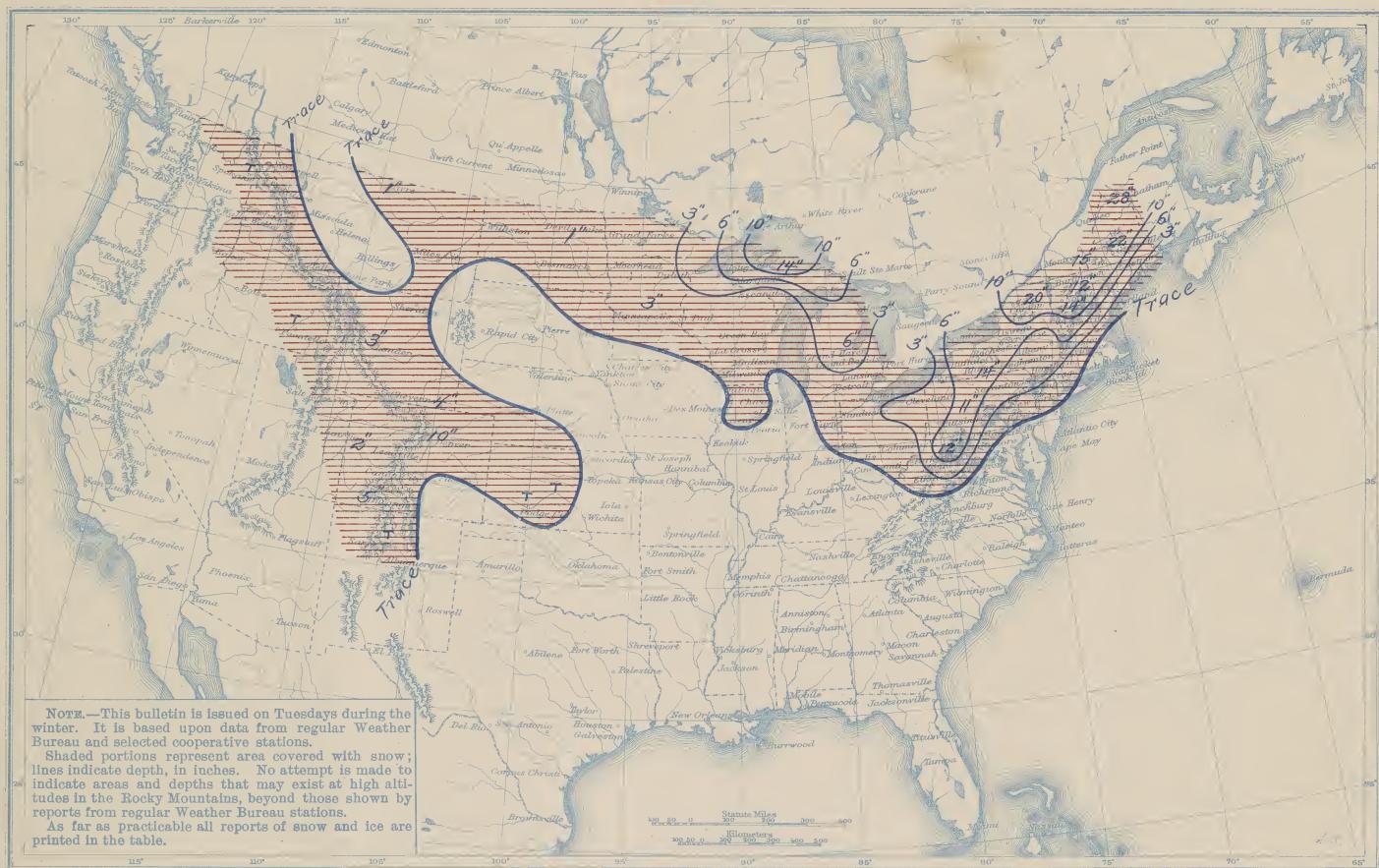
| Stations. | Show. | Ice in rivers har- bors, etc. | Stations. | Show. | Ice in rivers har- bors, etc. | Stations. | Show. | Ice in rivers har- bors, etc. |
|----------------|--------|-------------------------------------|---------------------|--------|-------------------------------------|------------------|--------|-------------------------------------|
| Colorado. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | Ohio. | Inches | Inches |
| Denver | 15 | | Harrisville | 3 | | Canton | 7 | |
| Durango | 8 | | Iron River | 2 | | Cincinnati | 1 | 0.0 |
| Grand Junction | 2 | | Ironwood | 3 | | Cleveland | 5 | 0.0 |
| Pueblo | 2 | | Lansing | 7 | | Columbus | 8 | |
| Connecticut. | | | Ludington | 2 | * | Dayton | 5 | |
| New Haven | T. | 0.0 | Mackinaw | 1 | | Marion | 5 | |
| West Cornwall | 4 | | Mancelona | 4 | | Sandusky | 4 | 1.0 |
| Illinois. | | | Marquette | 3 | 0.0 | Tiffin | 6 | |
| Bloomington | 1 | | Pott. Huron | 5 | 3.0 | Toledo | 4 | 0.0 |
| Charleston | T. | | Rock | 6 | | Wauseon | 2 | |
| Dwight | 2 | | Saginaw | 4 | 4.0 | Youngstown | 15 | |
| Equality | T. | | Sault Ste. Marie | 2 | 1.0 | Oregon, | | |
| Joliet | 2 | | South Haven | 2 | | Baker | 2 | |
| Monmouth | | | Minnesota. | | | Pennsylvania. | | |
| Peoria | 2 | 0.0 | Collegeville | 5 | | Coatesville | 2 | |
| Walnut | 1 | | Duluth | 5.0 | | Drift | 8 | |
| Indiana. | | | Fort Riley | 2 | | Emporium | 10 | * |
| Bloomington | 4 | | Grand Meadow | 3 | | Erie | 9 | |
| Evansville | T. | 0.0 | Hinckley | 3 | | Franklin | 25 | |
| Fort Wayne | 1 | | International Falls | 2 | | Greensboro | 2 | |
| Indianapolis | 1 | | Minneapolis | 3 | | Greenville | 13 | |
| Knox | 4 | | Moorehead | 1 | 12.0 | Hanover | 4 | |
| La Fayette | T. | | Reeds | 2 | | Harrisburg | 1 | † |
| Marion | 4 | | St. Paul | 4 | ** | Huntingdon | 8 | |
| Paoli | 2 | | State Sanatorium | 2 | | Indiana | 10 | |
| Richmond | 4 | | Worthington | 1 | | Johnstown | 7 | |
| Winona Lake | 4 | | Iowa. | | | Meadville | 22 | |
| Atlantic | T. | | Columbia | T. | | Parkers Landing | 11 | |
| Charles City | T. | | Kansas City | T. | † | Pittsburgh | 10 | 0.0 |
| Davenport | T. | † | Maryville | 2 | | Reading | 1 | 0.0 |
| Des Moines | T. | 7.0 | Unionville | 1 | | Ridgway | 20 | |
| Dubuque | T. | * | Montana. | | | Schroon | T. | |
| Keokuk | T. | * | Kalispell | T. | | Somerset | 15 | |
| Sioux City | 1 | 0.0 | Nebraska. | | | Towanda | 11 | |
| Kansas. | | | Lincoln | T. | | Warren | 16 | |
| Ellinwood | T. | | Omaha | T. | 4.0 | West Newton | 4 | |
| Marion | 1 | | York | 1 | | Rhode Island. | | |
| Topeka | T. | | New Hampshire. | | | Block Island | | |
| Wallace | T. | | Bethlehem | 6 | | Naragansett Pier | T. | |
| Wichita | T. | | Concord | 6 | 9.5 | South Dakota. | | |
| Kentucky. | | | Durham | 4 | | Huron | T. | 12.5 |
| Eubank | 2 | | Hanover | 18 | | Pierre | T. | 12.0 |
| Greensburg | 2 | | Keene | 5 | | Yankton | 1 | 5.0 |
| Hopkinsville | T. | | West Stewartstown | 11 | | Tennessee. | | |
| Lexington | 1 | | New Jersey. | | | Knoxville | 1 | 0.0 |
| Louisville | T. | 0.0 | Newark | T. | | Vermont. | | |
| Maysville | T. | | Newton | 5 | | Brattleboro | 8 | 11.0 |
| Mount Sterling | 2 | | Philadelphia | 1 | | Burlington | 7 | 0.0 |
| Maine. | | | Nebraska. | | | Northfield | 12 | |
| Bangor | 6 | 9.0 | Santa Fe | T. | | St. Johnsbury | 8 | |
| Cornish | 13 | | New York. | | | Well River | 8 | |
| Eastport | T. | 0.0 | New York. | | | Virginia. | | |
| Gardiner | 10 | 9.0 | Addison | 17 | | Mount Weather | 8 | |
| Greenville | 18 | 13.0 | Albany | 3 | 4.5 | Woodstock | T. | |
| Lewiston | 10 | 9.0 | Binghamton | 2 | | Wytheville | 12 | |
| Millinocket | 10 | | Buffalo | 4 | 0.0 | West Virginia. | | |
| Orono | 8 | | Canton | 3 | | Bayard | | |
| Portland | 4 | 0.0 | Cooperstown | 6 | | Charleston | 2 | |
| Massachusetts. | | | Herkimer | 4 | | Elkins | 8 | 0.0 |
| Boston | T. | | Ithaca | 4 | | Fairmont | 8 | |
| Concord | 2 | | Lake Placid | 6 | | Hinton | 24 | |
| Fitchburg | 4 | | Malone | 2 | | Parkersburg | T. | 0.0 |
| Michigan. | | | New York. | T. | | Rowlesburg | 10 | |
| Alpena | 1 | 1.0 | Ogdensburg | 3 | | Wisconsin. | | |
| An Arbor | 8 | | Oswego | 3 | 5.5 | Ashland | 2 | |
| Battle Creek | 8 | | Oxford | 4 | | Eau Claire | 2 | |
| Big Rapids | 3 | | Plattsburgh | 6 | | Green Bay | 0 | 2.5 |
| Cadillac | 1 | | Rochester | 6 | 6.0 | La Crosse | 3 | 0.0 |
| Calumet | 2 | | Setauket | 2 | | Madison | T. | 2 |
| Chatham | 4 | | Syracuse | 4 | | Medford | T. | 0.0 |
| Detroit | 3 | 0.0 | Watertown | 10 | | Milwaukee | T. | |
| Escanaba | T. | * | Watertown | 3 | | Racine | T. | |
| Grand Haven | 4 | | North Dakota. | | | Spooner | 3 | |
| Grand Rapids | 3 | | Bismarck | 1 | 10.0 | Wyoming. | | |
| Houghton | 1 | 5.0 | Devils Lake | 1 | | Cheyenne | 6 | |
| | | | Williston | 0 | 16.5 | Lander | 3 | |
| | | | | | | Yellowstone Park | T. | |

* Shore ice.

† Floating ice.

T. indicates trace.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., January 13, 1914.

DEPTH OF SNOW.

During the first half of the week, but little rain or snow occurred over any portion of the country, and the moderately warm weather prevailing over the central districts favored the melting of a considerable amount of the snow covering reported at the end of the preceding week. During the latter part of the week two rather unimportant storms moved from the Canadian Northwest to the Lake region and thence to New England, but without material precipitation; such as occurred, however, was mostly snow. No appreciable precipitation, either as rain or snow, occurred over the central and southern districts during the entire week, and there appears to have been but little snow in the mountain districts of the West.

The small amounts of snow that were general over the lower Ohio and middle Mississippi valleys and middle Plains region at the end of the previous week largely disappeared during the early part of the present week, and the ground over the greater part of the winter wheat region has been bare during the present cold period. In the upper Ohio drainage and in the Appalachian Mountain region from western North Carolina to northern Pennsylvania a considerable portion of the rather heavy covering of last week has likewise disappeared, although in the higher elevations there is still considerable snow.

Over northern New York and the interior and northern portions of New England there was a small increase during the week and the ground in those districts now has a covering ranging from 6 inches to 2 feet or more in depth. In the upper Lake region there has likewise been some increase in the amount of snow, the depth now ranging from 6 to 10 inches.

In the Missouri Valley and generally over the Plains region there is still little or no snow, and in the mountain regions of the West there was practically no increase over the amounts reported last week. In fact, some decrease has occurred in the lower levels, but the ground still appears to be well covered in Colorado and portions of adjoining States where deep snow has prevailed since early in December.

ICE IN RIVERS AND HARBORS.

Moderately cold weather along the northern border during the early part of the week just ended, and a general cold wave over all districts from the Rocky Mountains eastward at the close caused the formation of considerable additional ice in the streams and lakes of the northern districts. At the same time some ice formed on the streams of the middle districts.

The Missouri River now appears ice-bound from Omaha northward, and similar conditions prevail in portions of the upper Mississippi, with shore and floating ice in the river as far south as St. Louis.

In the Lake region there has been a very general increase over the amounts reported last week and some ice has now formed in most of the ports, the thickness however being less than 6 inches, except at a few points on Lake Ontario.

In New England a fair thickness has been attained on the interior lakes and streams and the ice harvest is reported to have begun on the Connecticut.

The rivers of the Ohio system and those of the Middle Atlantic States to southward of the Hudson continue free of ice, except over the headwaters and in the smaller streams, where small amounts are reported.

The following special reports have been received:

Brattleboro, Vt., January 12.—Ice harvesting on the Connecticut River has begun. The ice is of very good quality, and in some places as much as 15 inches thick.

Hartford, Conn., January 13.—In Connecticut and Massachusetts the ground in the Connecticut Valley is mostly bare. The ice in the Connecticut River has increased greatly in thickness, and cutting has commenced in northern sections.

Anchorage, N. Y., January 13.—The snow in the Hudson Valley averages 4 inches deep, the greatest depth being 12 inches at Corinth. The snow in the Mohawk Valley averages 3 inches deep. The ice on the Hudson and Mohawk rivers averages 7 inches thick.

Binghamton, N. Y., January 13.—The snow in the upper Susquehanna Valley

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., JANUARY 12, 1914.

| Stations. | | Snow. Ice in rivers, har- bors, etc. | | Stations. | | Snow. Ice in rivers, har- bors, etc. | | Stations. | | Snow. Ice in rivers, har- bors, etc. | |
|------------------|--------|---|--|---------------------|--------|---|--|------------------|--------|---|--|
| Colorado. | Inches | Inches | | Minnesota. | Inches | Inches | | Ohio. | Inches | Inches | |
| Denver | 10 | | | Angus | T. | | | Ashland | 4 | | |
| Durango | 5 | | | Collegeville | 3 | | | Cadiz | 6 | | |
| Grand Junction | 2 | | | Duluth | 4 | 6.5 | | Cleveland | 2 | 0.0 | |
| Connecticut. | | | | Fergus Falls | T. | | | Columbus | T. | | |
| Hartford | T. | 0.5 | | Fort Ripley | T. | | | Coshocton | T. | | |
| Hawleyville | T. | | | International Falls | 1 | | | Dayton | T. | | |
| West Cornwall | 2 | | | Mankato | T. | | | Philo | T. | | |
| Idaho. | | | | Milan | T. | | | Sandusky | 1 | 4.0 | |
| Pocatello | T. | | | Minneapolis | T. | | | Tiffin | 2 | | |
| Illinois. | | | | Moorhead | T. | | | Toledo | 1 | 1.0 | |
| Dwight | T. | | | Reeds | 2 | | | Wauseon | T. | | |
| Joliet | T. | | | St. Paul | T. | 7.0 | | Waverly | T. | | |
| Monmouth | T. | | | State Sanatorium | 1 | | | Oregon. | | | |
| Peoria | 0 | 0.5 | | Missouri. | | | | Baker | T. | | |
| Walnut | T. | | | Hannibal | 0 | * | | Pennsylvania. | | | |
| Indiana. | | | | Kansas City | 0 | † | | Blosserville | T. | | |
| Fort Wayne | T. | | | St. Louis | 0 | † | | Center Hall | 11 | | |
| Marion | T. | | | Montana. | | | | Coatesville | 1 | | |
| Richmond | T. | | | Havre | 1 | | | Drifton | 5 | | |
| Terre Haute | 0 | 0.5 | | Miles City | T. | | | Emporia | 3 | | |
| Iowa. | | | | Nebraska. | | | | Erie | 2 | 1.0 | |
| Davenport | 0 | *† | | North Platte | T. | | | Harrisburg | T. | † | |
| Des Moines | 0 | 9.0 | | Omaha | 0 | 7.0 | | Huntingdon | 6 | | |
| Dubuque | 0 | 12 | | Nevada. | | | | Hyndman | 2 | | |
| Keokuk | 0 | 3.0 | | Reno | 1 | 0.0 | | Lawrenceville | 14 | | |
| Sioux City | 0 | 4.0 | | New Hampshire. | | | | Philadelphia | T. | 0.0 | |
| Kansas. | | | | Bethlehem | 10 | | | Pittsburgh | 3 | † | |
| Concordia | T. | | | Concord | 8 | 18.0 | | Reading | T. | 0.0 | |
| Dodge City | T. | | | Durham | 4 | | | Scranton | T. | | |
| Elliwood | T. | | | Hanover | 14 | | | Sunbury | 2 | | |
| Medicine Lodge | T. | | | Lancaster | 10 | | | Williamsport | 4 | | |
| Maine. | | | | West Stewartstown | 15 | | | South Dakota. | | | |
| Bangor | 8 | 11.0 | | New Jersey. | | | | Huron | T. | 14.5 | |
| Cornish | 14 | | | Long Branch | T. | | | Pierre | 0 | 18.0 | |
| Eastport | 3 | 0.0 | | Newton | 4 | | | Yankton | 0 | 7.0 | |
| Gardiner | 12 | 10.5 | | Phillipsburg | T. | | | Vermont. | | | |
| Greenville | 22 | 16.0 | | Trenton | T. | * | | Bellows Falls | 7 | | |
| Lewiston | 12 | 9.5 | | New Mexico. | | | | Brattleboro | 7 | 18.0 | |
| Millinocket | 17 | | | Santa Fe. | T. | | | Burlington | 8 | 0.0 | |
| Portland | 4 | 0.0 | | New York. | | | | Lyndonville | 12 | | |
| Van Buren | 28 | | | Addison | 10 | | | Northfield | 18 | | |
| Massachusetts. | | | | Albany | 1 | 6.0 | | Wells River | 12 | | |
| Fitchburg | 3 | | | Beaver River | 20 | | | Virginia. | | | |
| Nantucket | T. | 0.0 | | Binghamton | T. | | | Mount Weather. | T. | | |
| Michigan. | | | | Buffalo | 7 | * | | Wytheville | T. | | |
| Alpena | 4 | *† | | Cooperstown | 5 | | | Washington. | | | |
| Ann Arbor | 6 | | | Corinth | 12 | | | Spokane | T. | | |
| Cadillac | 8 | | | Earlville | 14 | | | West Virginia. | | | |
| Calumet | 9 | | | Herkimer | 3 | | | Bayard | 12 | | |
| Chatham | 14 | | | Ithaca | 2 | | | Elkins | 2 | † | |
| Detroit | T. | 1.0 | | Lake Placid | 20 | | | Glenville | 4 | | |
| Escanaba | T. | 1.0 | | Malone | 10 | | | Parkersburg | T. | 0.0 | |
| Grand Haven | 2 | | | Ogdensburg | 18 | | | Wisconsin. | | | |
| Grand Rapids | 3 | | | Oswego | 2 | | | Ashland | 2 | | |
| Harrisville | 3 | | | Oxford | 5 | | | Eau Claire | 2 | | |
| Houghton | 10 | 6.5 | | Plattsburgh | 6 | | | Green Bay | T. | 5.0 | |
| Ironwood | 8 | | | Rochester | 6 | 7.0 | | Koepenick | 2 | | |
| Lansing | 4 | | | Rome | 2 | | | La Crosse | 1 | 6.0 | |
| Ludington | 1 | * | | Saranac Lake | 10 | | | Madison | T. | | |
| Mancelona | 4 | | | Setauket | T. | | | Medford | 1 | | |
| Manistee | 2 | | | Syracuse | 4 | | | Milwaukee | T. | 0.0 | |
| Marquette | 12 | 1.5 | | Watertown | 6 | | | Sheboygan | T. | | |
| Newberry | 7 | | | North Dakota. | | | | Spooner | 3 | | |
| Port Huron | 2 | 5.0 | | Bismarck | T. | 14.5 | | Wyoming. | | | |
| Saginaw | 6 | 5.0 | | Devils Lake | 1 | | | Cheyenne | 4 | | |
| Sault Ste. Marie | 8 | 2.5 | | Williston | T. | 15.5 | | Lander | 3 | | |
| South Haven | 2 | | | | | | | Sheridan | T. | | |
| | | | | | | | | Yellowstone Park | T. | | |

*Shore ice. †Floating ice. ‡Ice gorged. § Measurement impracticable. T. indicates trace.

averages 5 inches deep, and in the Unadilla, Chenango, and Tioughnioga 6 inches, the greatest depth reported being 14 inches at Earlville, N. Y.

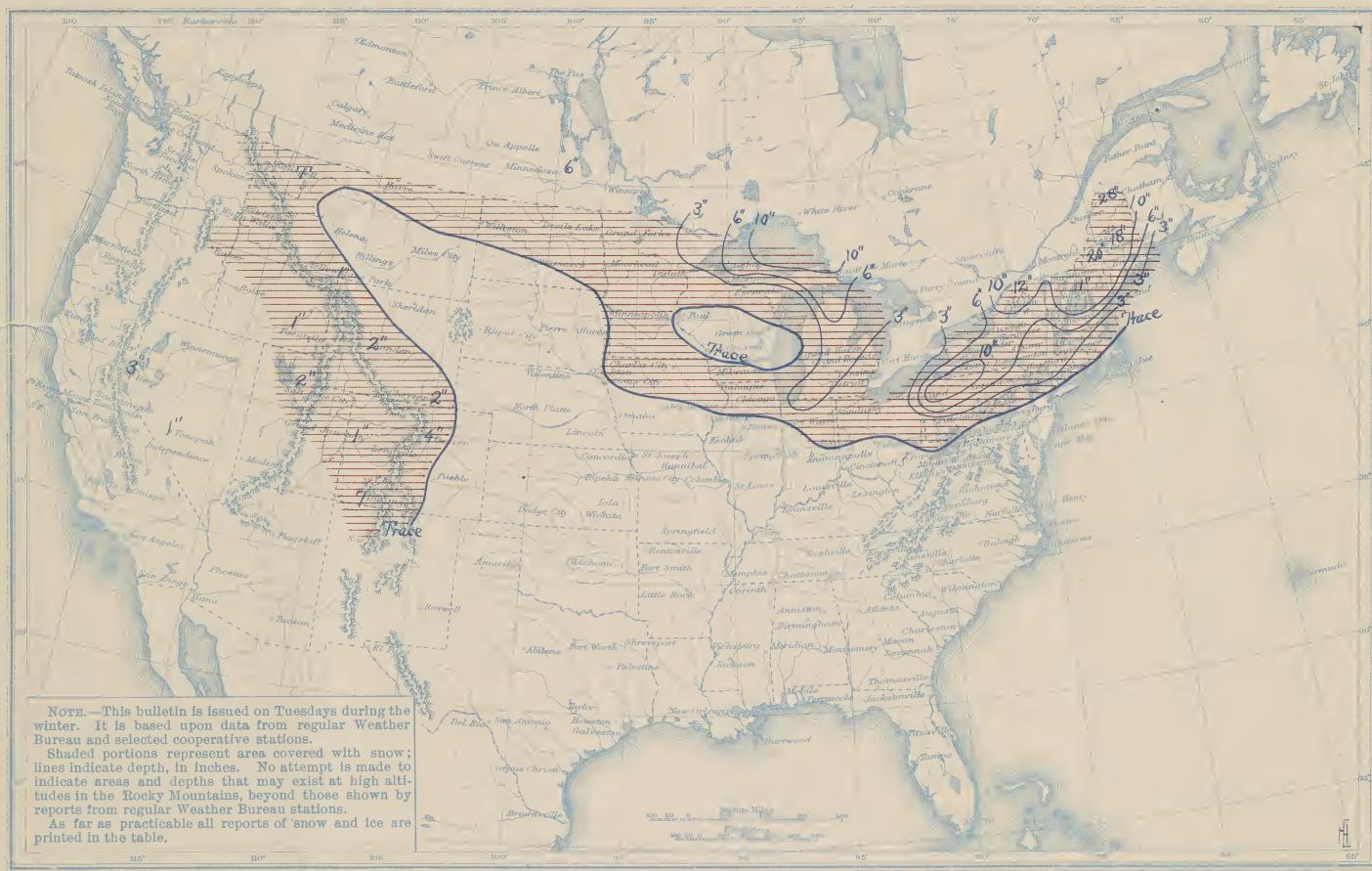
Dubuque, Iowa, January 12.—The Mississippi River here closed over this morning, but the ice is unsafe to measure.

Hannibal, Mo., January 12.—There would be floating ice in the Mississippi River here but for a gorge upstream.

P. C. DAY, Climatologist and Chief of Division.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.
CHARLES F. MARVIN, CHIEF.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., January 20, 1914.

DEPTH OF SNOW.

The early part of the week was very generally without material precipitation, either rain or snow.

Toward the end of the week some snow occurred in the Lake region, upper Ohio Valley, and portions of the Middle Atlantic States and New England, and a severe storm, accompanied by rain and snow developed over the Pacific Coast States. The effects of the latter were confined mainly to the region from the Rocky Mountains westward, the rainfall being especially heavy at the lower elevations in California, with a probability of much snow in the mountains.

At the close of the week unsettled weather developed over the upper Mississippi Valley, and at this writing a considerable depression covers the Lake region with light local precipitation, and indications of heavy snows in the mountain regions of northern New York and New England.

For the week as a whole there was little increase of snow depth in any portion of the country save in the far western mountains, especially those of California and Oregon. No direct reports have been received from those localities, but in view of the heavy precipitation, mostly rain, at the lower elevations on both sides of the Sierra it is fairly safe to assume that heavy snow must have occurred in the high mountains.

At the close of the week a considerable body of snow still remained over the northern headwaters of the Ohio above Pittsburgh, and from thence over central and northern New York to New England, where the depth ranges from 6 inches to more than 2 feet.

There were slight increases at a few points in the Lake region, but, as a rule, the snow depth over that region is now less than one week ago. The great central valleys, including nearly the entire winter wheat region and the northern districts from the Great Lakes westward to the Rocky Mountains, still remain largely free of snow, and some reduction of the depth has occurred in the central Rocky Mountain region, although the ground at the lower elevations still remains covered in portions of Colorado and Wyoming, a condition that has continued since early in December.

Small amounts of snow now appear at many of the lower elevations in the Plateau region, and it is probable that amounts considerably in excess of those shown occurred in the higher elevations.

ICE IN RIVERS AND HARBORS.

The cold wave referred to in last week's bulletin as prevailing over the districts to eastward of the Rocky Mountains moved rapidly to the Atlantic coast, and by Wednesday morning moderate weather was again prevalent over all districts, save to eastward of the Appalachian Mountains. By the following morning the cold wave had practically disappeared from the last-named district and warm weather for the season continued, with minor exceptions, throughout the remainder of the week.

Considerable ice formed over the northern and eastern districts during the early part of the week, and a fair thickness was available for harvest on the small streams and ponds over much of the region where provision is usually made for gathering local supplies.

In the Missouri and Mississippi valleys some ice disappeared in the middle portions during the latter part of the week, and the amount is now less than at the end of the preceding week, and similar conditions obtained at points in the western upper Lake region.

Over most of the Lake region, however, there is now considerably more ice than at any previous period during the winter, and like conditions prevailed on the rivers of New York and New England where the thickness now ranges from 8 to 15 inches, and harvesting is probably very general.

Some ice is reported from the upper Ohio and its tributaries and on the smaller streams of the Middle Atlantic States, but the main streams continue open.

The following special reports have been received:

Hartford, Conn., January 20.—In the Connecticut Valley through Massachusetts and Connecticut the snow averages 2 inches deep, but to northward it is considerably deeper. The ice in the river has increased in thickness and harvesting is now general. Navigation of the lower river closed on the 13th.

New Haven, Conn., January 19.—The ice on nearby ponds is from 8 to 10 inches thick.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., JANUARY 19, 1914.

| Stations. | Snow. | ice in rivers, har- bors, etc. | Stations. | Snow. | ice in rivers, har- bors, etc. | Stations. | Snow. | ice in rivers, har- bors, etc. |
|---------------------------|---------------|--------------------------------------|--------------------------|---------------|--------------------------------------|------------------------|---------------|--------------------------------------|
| <i>Colorado.</i> | <i>Inches</i> | <i>Inches</i> | <i>Michigan—Cont'd.</i> | <i>Inches</i> | <i>Inches</i> | <i>Ohio—Cont'd.</i> | <i>Inches</i> | <i>Inches</i> |
| Denver..... | 4 | ..... | Mancelona..... | 8 | * | New Bremen..... | 1 | ..... |
| Durango..... | 7 | ..... | Marquette..... | 12 | * | Philo..... | T. | ..... |
| Grand Junction..... | 1 | ..... | Newberry..... | 7 | ..... | Sandusky..... | T. | 5.5 |
| <i>Connecticut.</i> | | | Port Huron..... | 2 | 7.0 | Tiffin..... | T. | ..... |
| Hartford..... | 2 | 3.0 | Saginaw..... | 3 | 7.5 | Toledo..... | 0 | 4.0 |
| Hawleyville..... | 2 | ..... | Sault Ste. Marie..... | 10 | 7.0 | Wauseon..... | T. | ..... |
| New Haven..... | 3 | 9.0 | South Haven..... | 5 | ..... | <i>Oregon.</i> | | |
| West Cornwall..... | 4 | ..... | <i>Minnesota.</i> | | | Baker..... | 3 | ..... |
| <i>Dist. of Columbia.</i> | | | Angus..... | T. | | Pennsylvania. | | |
| Washington..... | 0 | * | Collegeville..... | 2 | ..... | Clarion..... | 13 | ..... |
| <i>Idaho.</i> | | | Duluth..... | 3 | 8.0 | Coatesville..... | T. | ..... |
| Pocatello..... | 1 | ..... | Fort Ripley..... | T. | | Confluence..... | 1 | ..... |
| <i>Illinois.</i> | | | Grand Meadow..... | T. | | Drifton..... | 7 | ..... |
| Chicago..... | T. | | International Falls..... | 2 | ..... | Erie..... | 1 | 7.0 |
| Joliet..... | 2 | ..... | Mankato..... | T. | | Franklin..... | 12 | ..... |
| Rockford..... | 1 | ..... | Milan..... | T. | | Greenville..... | 10 | ..... |
| Walnut..... | T. | | Moorhead..... | T. | 18.0 | Harrisburg..... | T. | † |
| <i>Indiana.</i> | | | St. Paul..... | T. | *† | Huntingdon..... | 4 | ..... |
| Fort Wayne..... | T. | | State Sanatorium..... | 1 | ..... | Johnstown..... | 2 | ..... |
| Knox..... | 3 | ..... | Winton..... | 4 | ..... | Meadville..... | 14 | ..... |
| Marion..... | 2 | ..... | Worthington..... | 2 | ..... | Parkers Landing..... | 9 | ..... |
| Richmond..... | 1 | ..... | <i>Montana.</i> | | | Philadelphia..... | 0 | * |
| <i>Iowa.</i> | | | Havre..... | T. | | Pittsburgh..... | 1 | † |
| Charles City..... | T. | | Kalispell..... | T. | | Ridgway..... | 9 | ..... |
| Davenport..... | T. | 0.0 | <i>Nebraska.</i> | | | Saltsburg..... | 2 | ..... |
| Des Moines..... | 0 | 9.0 | Omaha..... | 0 | 5.0 | Scranton..... | 1 | ..... |
| Dubuque..... | T. | ‡ | Nevada. | | | Sunbury..... | 1 | ..... |
| Estherville..... | T. | | Reno..... | 3 | 0.0 | Towanda..... | 7 | ..... |
| Forest City..... | 1 | ..... | Topah..... | 1 | ..... | Warren..... | 13 | ..... |
| Iowa City..... | T. | | <i>New Hampshire.</i> | | | West Newton..... | T. | |
| Sioux City..... | T. | 6.0 | Bethlehem..... | 11 | ..... | Williamsport..... | 3 | ..... |
| Waterloo..... | 1 | ..... | Concord..... | 8 | 15.5 | <i>Rhode Island.</i> | | |
| Bangor..... | 13 | 15.0 | Durham..... | 4 | ..... | Block Island..... | 0 | * |
| Cornish..... | 13 | ..... | Hanover..... | 13 | ..... | Kingston..... | T. | ..... |
| Eastport..... | 2 | 0.0 | Keene..... | 7 | ..... | Narragansett Pier..... | T. | ..... |
| Gardiner..... | 12 | 13.0 | West Stewartstown..... | 12 | ..... | Providence..... | T. | 0.0 |
| Greenville..... | 20 | 14.0 | <i>New Jersey.</i> | | | <i>South Dakota.</i> | | |
| Lewiston..... | 11 | 12.0 | Cape May..... | 0 | *† | Huron..... | 0 | 14.0 |
| Millinocket..... | 18 | ..... | Newton..... | 3 | ..... | Pierre..... | 0 | 10.0 |
| Orono..... | 10 | ..... | Trenton..... | 0 | 3.0 | Yankton..... | 0 | 6.5 |
| Portland..... | 4 | 0.0 | <i>New York.</i> | | | <i>Utah.</i> | | |
| Van Buren..... | 28 | ..... | Addison..... | 10 | ..... | Salt Lake City..... | 2 | ..... |
| <i>Massachusetts.</i> | | | Albany..... | 4 | 8.5 | Vermont. | | |
| Amherst..... | 2 | ..... | Binghamton..... | 2 | ..... | Bellows Falls..... | 7 | ..... |
| Boston..... | T. | | Buffalo..... | 12 | ..... | Brattleboro..... | 7 | 15.0 |
| Concord..... | 2 | ..... | Canton..... | 10 | ..... | Burlington..... | 8 | * |
| Fitchburg..... | 4 | ..... | Herkimer..... | 4 | ..... | Northfield..... | 13 | ..... |
| Mansfield..... | 1 | ..... | Ithaca..... | 4 | ..... | St. Johnsbury..... | 11 | ..... |
| Nantucket..... | 0 | 4.0 | Lowville..... | 6 | ..... | White River Junc..... | 7 | ..... |
| <i>Michigan.</i> | | | Malone..... | 12 | ..... | <i>Virginia.</i> | | |
| Alpena..... | 5 | 3.5 | Ogdensburg..... | 15 | ..... | Mount Weather..... | T. | ..... |
| Ann Arbor..... | 1 | ..... | Oswego..... | 5 | 11.5 | West Virginia. | | |
| Battle Creek..... | 4 | ..... | Oxford..... | 6 | 10.0 | Elkins..... | T. | * |
| Big Rapids..... | 4 | ..... | Rochester..... | 6 | ..... | Rowlesburg..... | 2 | ..... |
| Cadillac..... | 5 | ..... | Rome..... | 4 | ..... | <i>Wisconsin.</i> | | |
| Calumet..... | 10 | ..... | Setauket..... | T. | | Ashland..... | 1 | ..... |
| Chatham..... | 12 | ..... | Watwick..... | 10 | ..... | Green Bay..... | 0 | 5.0 |
| Detroit..... | T. | 5.0 | Watertown..... | 6 | ..... | Koepenick..... | 1* | ..... |
| Escanaba..... | T. | 0.0 | <i>North Dakota.</i> | | | La Crosse..... | 0 | 8 |
| Grand Rapids..... | T. | ..... | Bismarck..... | T. | 16.0 | Lake Mills..... | 1 | ..... |
| Harrisville..... | 4 | ..... | Devils Lake..... | 1 | ..... | Medford..... | T. | |
| Houghton..... | 7 | 5.0 | Williston..... | 1 | 16.5 | Wausau..... | T. | |
| Iron Mountain..... | T. | ..... | <i>Ohio.</i> | | | <i>Wyoming.</i> | | |
| Ironwood..... | 6 | ..... | Ashland..... | 2 | ..... | Cheyenne..... | 2 | ..... |
| Lansing..... | 3 | ..... | Canton..... | T. | ..... | Lander..... | 2 | ..... |
| Ludington..... | T. | * | Coshocton..... | T. | ..... | Yellowstone Park..... | 1 | ..... |

*Snow ice. † Floating ice. ‡ Ice gorged. § Measurement impracticable. T indicates trace.

Albany, N. Y., January 20.—The snow in the Hudson Valley below Albany and in the Mohawk Valley averages 5 inches deep. The ice on the Hudson River averages 9 inches thick and on the Mohawk River 10 inches thick.

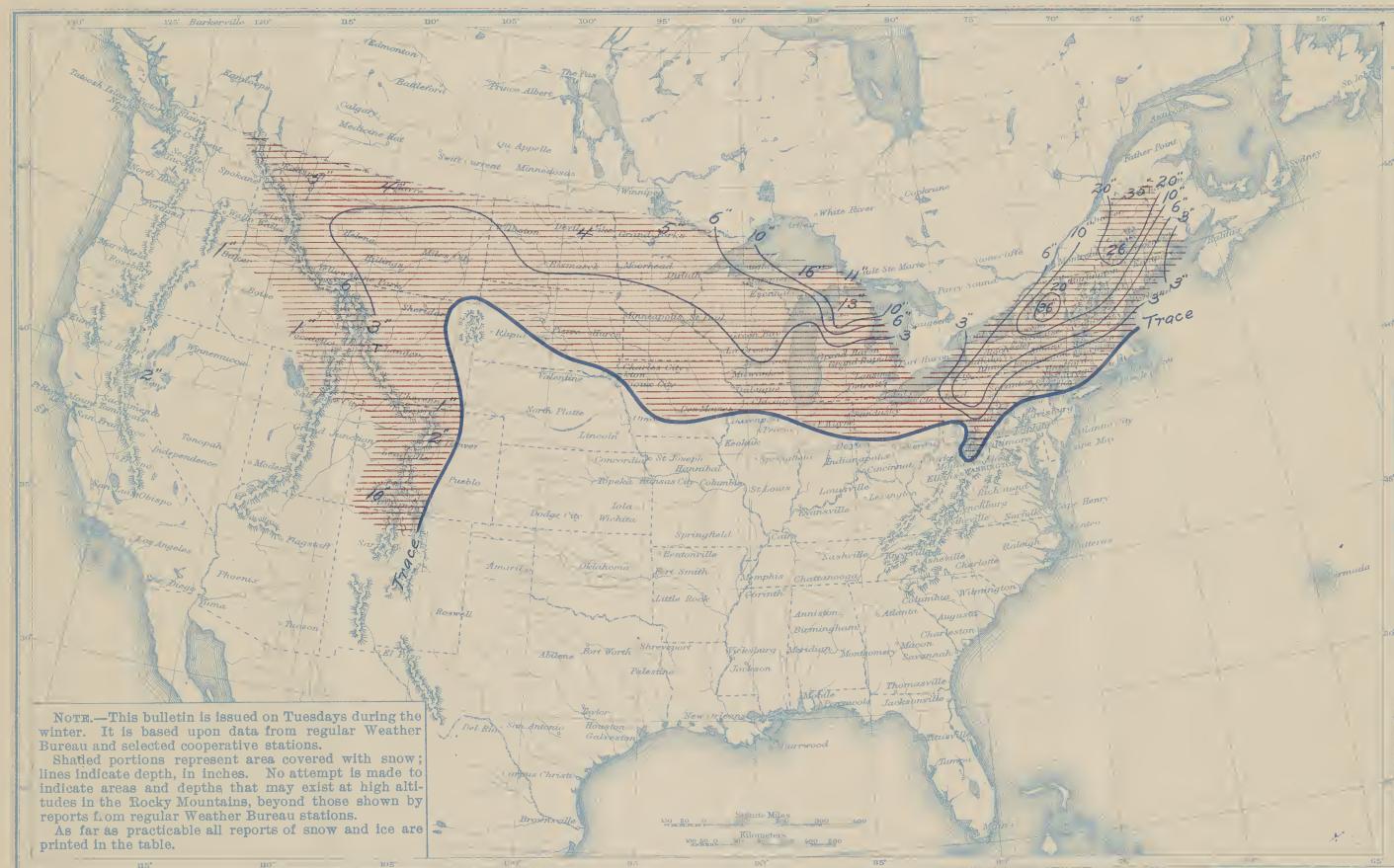
Pittsburgh, Pa., January 19.—The tributaries of the upper Ohio River are frozen over in their headwaters. Owing to ice gorges above there is no ice at this city.

Dubuque, Iowa, January 19.—In the channel of the Mississippi River there is only thin ice, covered with slush, and unsafe to measure.

P. C. DAY, Climatologist and Chief of Division.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.
CHARLES F. MARVIN, CHIEF.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., January 27, 1914.

DEPTH OF SNOW.

The storm central over the Lake region at the beginning of the week moved to the New England coast by Wednesday, accompanied by general rains or snows from the Lake region and Ohio Valley eastward; considerable snow occurred to the northward of the storm center, but to the southward the precipitation was mostly rain. At the same time stormy weather prevailed over the far Northwest, with general rains at the lower elevations and snows in the mountains.

Toward the latter part of the week general, and, in some places, heavy precipitation occurred over the eastern districts, but snow was again confined to the more northern districts.

Stormy conditions continued in the far Northwest, extending to the southward and eastward as the week advanced, and from Saturday to Monday rains and snows were general from the Rocky Mountains westward, the rains being heavy in the Pacific coast States, especially in portions of California, where serious floods are now prevailing with much damage to property and some loss of life. Considerable snow appears to have fallen in the northern mountain districts during the latter part of the week, and it is probable there were heavy falls in the coast and Sierra ranges as well.

But little change has occurred in the snow covered area since the last issue of this bulletin. Slight increases occurred over the northern districts from the Lake region westward to the mountains, and there is now a covering of several inches over the extreme northern districts, and depths of from 10 to 15 inches prevail in the extreme upper Lake region.

In the Appalachian Mountain districts and over the headwaters of the Ohio River there is now somewhat less snow than at the end of the preceding week, while in portions of New York and generally over New England the depth increased several inches.

In the northern Rocky Mountain districts there appears to have been considerable snow, but in the central and southern districts apparently but little occurred and the depths reported are generally somewhat less than a week ago. In view of the stormy weather prevailing during much of the week over the far western districts it is probable much snow has fallen in the high mountains of California, Oregon, and Washington, although little is reported at lower levels.

ICE IN RIVERS AND HARBORS.

No marked cold weather occurred during the week just ended, and such additional ice as formed, over the amounts reported last week, was confined to the more northern districts. At the present writing the Missouri River is closed from Sioux City, Iowa, northward, the increase during the week ranging from 4 to 5 inches; to the southward of Sioux City some ice disappeared, and only floating or shore ice is reported in the lower portions. The upper portion of the Mississippi River is closed and only floating or shore ice is reported between La Crosse and Keokuk, while to the southward of the last-named place the river appears to be entirely free of ice.

Small increases occurred in the amounts of ice reported from the harbors of the Great Lakes; the greatest thickness, however, is still but slightly more than 12 inches and no appreciable amounts have yet formed on some of the less protected harbors.

In New England and over northern New York increases varying from 1 to 4 inches occurred on the rivers and lakes and ice of excellent quality, from 10 to 15 inches in thickness, is now being harvested. The Ohio and most of its tributaries still remain free of ice, as well as the larger streams of the Atlantic coast States from the Hudson southward.

Compared with the same period one year ago there is generally less ice now over the Missouri and Mississippi river systems and in the upper Lake region, but more in the lower Lakes and New England.

The following special reports have been received:

Hartford, Conn., January 27.—In the Connecticut Valley through Massachusetts and Connecticut the snow averages 3 inches deep, but to northward it averages 12 inches, the greatest depth reported being 18 inches at Wells River, Vt. Ice harvesting is general, and the ice is of splendid quality.

Albany, N. Y., January 27.—The snow in the Hudson Valley ranges from a trace at Coxsackie to 10 inches deep at Corinth; in the Mohawk Valley it averages 6 inches deep. The ice on the Hudson River averages 11 inches, and on the Mohawk River 12 inches thick.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., JANUARY 26, 1914.

| Stations. | Snow. | Ice in rivers, har- bors, etc. | Stations. | Snow. | Ice in rivers, har- bors, etc. | Stations. | Snow. | Ice in rivers, har- bors, etc. |
|-----------------------|--------|--|--------------------------|--------|--|-----------------------|--------|--|
| Colorado. | Inches | Inches | Minnesota. | Inches | Inches | Ohio.—Cont'd. | Inches | Inches |
| Denver..... | 2 | ..... | Angus..... | 2 | 12.0 | Tiffin..... | 1 | ..... |
| Durango..... | 10 | ..... | Duluth..... | 5 | ..... | Toledo..... | T. | 1.0 |
| Connecticut. | ..... | ..... | Fergus Falls..... | 2 | ..... | Wauseon..... | 2 | ..... |
| Hartford..... | 2 | 7.0 | Fort Ripley..... | 3 | ..... | Youngstown..... | 1 | ..... |
| New Haven..... | 1 | 9.0 | Hinckley..... | 8 | ..... | Oregon. | ..... | ..... |
| West Cornwall..... | 1 | ..... | International Falls..... | 5 | ..... | Baker..... | 1 | ..... |
| Idaho. | ..... | ..... | Mankato..... | 1 | ..... | Pennsylvania. | ..... | ..... |
| Pocatello..... | 1 | ..... | Milan..... | 2 | ..... | Butler..... | 1 | ..... |
| Illinois. | ..... | ..... | Minneapolis..... | 2 | ..... | Clarion..... | 10 | ..... |
| Joliet..... | T. | ..... | Moorehead..... | 3 | 22.0 | Confluence..... | T. | ..... |
| Rockford..... | 2 | ..... | Reeds..... | 2 | ..... | Cresson..... | 15 | ..... |
| Indiana. | ..... | ..... | St. Paul..... | 0 | 8.0 | Drifton..... | 8 | ..... |
| Knox..... | 1 | ..... | Worthington..... | 2 | ..... | Emporium..... | 3 | ..... |
| Marion..... | T. | ..... | Missouri. | ..... | ..... | Erie..... | 1 | 6.0 |
| Winona Lake..... | 1 | ..... | Kansas City..... | 0 | † | Franklin..... | 7 | ..... |
| Iowa. | ..... | ..... | Montana. | ..... | ..... | Greenville..... | 5 | ..... |
| Atlantic..... | T. | ..... | Billings..... | T. | ..... | Harrisburg..... | 0 | * |
| Carroll..... | 2 | ..... | Havre..... | 4 | ..... | Hyndman..... | T. | ..... |
| Charles City..... | 2 | ..... | Helena..... | 1 | ..... | Indiana..... | 1 | ..... |
| Creston..... | T. | ..... | Kalispell..... | 5 | ..... | Johnstown..... | T. | ..... |
| Davenport..... | T. | † | Miles City..... | T. | ..... | Lawrenceville..... | 7 | ..... |
| Des Moines..... | 1 | 9.0 | Nebraska. | ..... | ..... | Meadville..... | 7 | ..... |
| Dubuque..... | 1 | * | Omaha..... | 0 | § | Parkers Landing..... | 5 | ..... |
| Estherville..... | 2 | ..... | Reno..... | 2 | 0.0 | Pittsburgh..... | T. | ‡ |
| Iowa City..... | 1 | ..... | New Hampshire. | ..... | ..... | Ridgway..... | 7 | ..... |
| Keokuk..... | 0 | * | Bethlehem..... | 10 | ..... | Saltsburg..... | T. | ..... |
| Sioux City..... | 0 | 10.0 | Concord..... | 11 | 20.0 | Somerset..... | T. | ..... |
| Maine. | ..... | ..... | Hanover..... | 18 | ..... | Warren..... | 8 | ..... |
| Bangor..... | 7 | 17.0 | Keene..... | 7 | ..... | Washington..... | 1 | ..... |
| Cornish..... | 12 | ..... | New Jersey. | ..... | ..... | Williamsport..... | 2 | ..... |
| Eastport..... | 1 | 0.0 | Newton..... | 2 | ..... | Rhode Island. | ..... | ..... |
| Gardiner..... | 9 | 14.0 | New York. | ..... | ..... | Naragansett Pier..... | 1 | ..... |
| Greenville..... | 26 | 15.0 | Addison..... | 8 | ..... | Providence..... | 1 | 0.0 |
| Lewiston..... | 11 | 15.5 | Albany..... | 3 | 9.5 | South Dakota. | ..... | ..... |
| Milnocket..... | 20 | ..... | Beaver River..... | 22 | ..... | Huron..... | T. | 18.0 |
| Orono..... | 7 | 0.0 | Binghamton..... | T. | ..... | Pierre..... | 2 | ..... |
| Portland..... | 5 | 0.0 | Bouckville..... | 11 | ..... | Yankton..... | T. | 11.0 |
| Van Buren..... | 35 | ..... | Buffalo..... | 3 | 3.5 | Utah. | ..... | ..... |
| Massachusetts. | ..... | ..... | Canton..... | 6 | ..... | Salt Lake City..... | T. | ..... |
| Adams..... | 4 | ..... | Cooperstown..... | 7 | ..... | Vermont. | ..... | ..... |
| Amherst..... | 1 | ..... | Earlville..... | 15 | ..... | Brattleboro..... | 7 | 16.0 |
| Boston..... | 1 | ..... | Herkimer..... | 5 | ..... | Burlington..... | 9 | * |
| Concord..... | 3 | ..... | Ithaca..... | 2 | ..... | Northfield..... | 19 | ..... |
| Fitchburg..... | 5 | ..... | Lake Placid..... | 36 | ..... | St. Johnsbury..... | 14 | ..... |
| Mansfield..... | 1 | ..... | Lowville..... | 12 | ..... | Wells River..... | 18 | ..... |
| Michigan. | ..... | ..... | Malone..... | 3 | ..... | West Virginia. | ..... | ..... |
| Alpena..... | 18 | 3.0 | Oswego..... | 5 | 13.5 | Bayard..... | 3 | ..... |
| Ann Arbor..... | 2 | ..... | Oxford..... | 6 | ..... | Wisconsin. | ..... | ..... |
| Battle Creek..... | 1 | ..... | Poughkeepsie..... | 3 | ..... | Ashland..... | 4 | ..... |
| Cadillac..... | 14 | ..... | Rochester..... | 6 | 12.0 | Green Bay..... | 3 | 6.0 |
| Calumet..... | 14 | ..... | Rome..... | 6 | ..... | Hancock..... | 3 | ..... |
| Detroit..... | 1 | 7.0 | Saranac Lake..... | 15 | ..... | Koopenick..... | 4 | ..... |
| Escanaba..... | 4 | 8.0 | Syracuse..... | 6 | ..... | La Crosse..... | 2 | 9.0 |
| Grand Haven..... | 1 | ..... | Watertown..... | 5 | ..... | Lake Mills..... | 3 | ..... |
| Grand Rapids..... | 18 | ..... | Watkins..... | 12 | ..... | Madison..... | 1 | ..... |
| Harrisville..... | 14 | ..... | North Dakota. | 4 | 21.0 | Medford..... | 2 | ..... |
| Houghton..... | 11 | 8.0 | Bismarck..... | 4 | ..... | Milwaukee..... | 2 | 0.0 |
| Iron Mountain..... | 2 | ..... | DeVils Lake..... | 4 | ..... | Mount Horeb..... | 2 | ..... |
| Lansing..... | 2 | ..... | Williston..... | 2 | 22.0 | New London..... | 6 | ..... |
| Ludington..... | 1 | * | Ohio. | ..... | ..... | Racine..... | 1 | ..... |
| Mackinaw..... | 18 | ..... | Ashland..... | T. | ..... | Wausau..... | 2 | ..... |
| Manistee..... | 2 | ..... | Cadiz..... | T. | ..... | Wyoming. | ..... | ..... |
| Marquette..... | 16 | 2.0 | Canton..... | T. | ..... | Cheyenne..... | 1 | ..... |
| Newberry..... | 9 | ..... | New Bremen..... | T. | ..... | Lander..... | T. | ..... |
| Port Huron..... | 2 | 8.0 | Sandusky..... | T. | 5.5 | Sheridan..... | T. | ..... |
| Saginaw..... | 2 | 8.0 | ..... | ..... | Yellowstone Park..... | 6 | ..... |  |
| Sault Ste. Marie..... | 11 | 9.0 | ..... | ..... | ..... | ..... | ..... | ..... |

* Shore ice. † Floating ice. ‡ Ice gorged. § Measurement impracticable. T. indicates trace.

Pittsburgh, Pa., January 26.—But little snow fell over the watersheds tributary to the upper Ohio River during the past week, and in consequence of high temperatures the amount on the ground decreased. The Allegheny River is gorged with ice between Pittsburgh and Freeport.

Dubuque, Iowa, January 26.—The shore ice in the Mississippi River here is generally from 3 to 6 inches thick, but between the wing dams 10 inches.

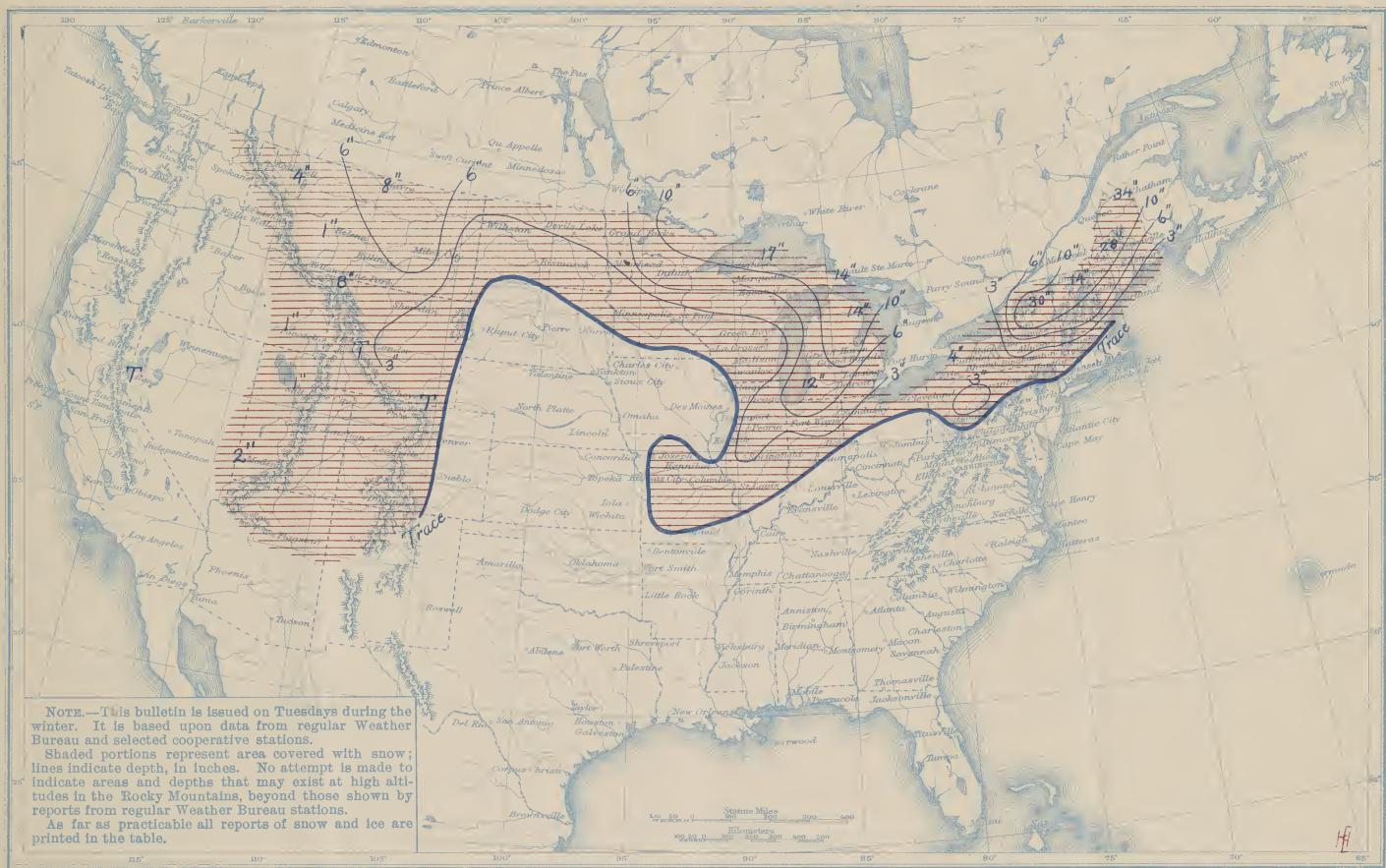
P. C. DAY, Climatologist and Chief of Division.

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STEVENS
MAR 21 1914
U. S. DEPARTMENT OF AGRICULTURE

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.

CHARLES F. MARVIN, CHIEF.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., February 3, 1914.

DEPTH OF SNOW.

The general stormy conditions over the far western districts referred to in the last issue of this bulletin abated early in the week just ended, but the storm movement continued eastward, decreasing markedly in force. By Friday morning, however, a southern extension had developed into a considerable storm area central over the middle Gulf States, which moved to the Ohio Valley by the following morning, attended by general, and in some cases, heavy rains over the eastern and southern portions of the storm area and by heavy snows in portions of the Ohio Valley and Lake region, Illinois, and Wisconsin.

The storm moved to the lower St. Lawrence Valley by Sunday morning, accompanied by rain or snow over much of the northeastern portion of the country. Some snow occurred over the far northern districts near the end of the week, but throughout much of the central and western portions of the country there was little precipitation, either as rain or snow during the latter half of the week.

No marked changes occurred in the snow-covered area of the country during the week, although small amounts now cover the ground over portions of the middle Mississippi Valley that were bare one week ago, and the amounts in the Lake region are very generally several inches greater than last week. In the middle Missouri Valley there has been some reduction in the snow-covered area as well as in the depth of the covering, while from West Virginia northeastward to and including much of New England there has been a considerable decrease in depth during the week.

In the interior of New England and over northern New York the depths now range from about 6 inches to nearly 3 feet, while in the upper Lake region the depths are somewhat less. There appears to have been considerable snow in portions of the northern Rocky Mountain region and at local points in the Plateau regions, although but little now remains on the ground at the lower levels.

The absence of any appreciable snowfall over much of the Middle Atlantic coast districts so far during this winter presents a condition probably without parallel in the history of this part of the country.

ICE IN RIVERS AND HARBORS.

Moderately warm weather throughout much of the week, with considerable rain during the latter part, prevented the formation of any additional ice, save in the more northern districts, and reduced to a considerable extent the small amounts that had previously formed on the streams of the middle tier of States.

There was an increase of several inches in the ice thickness over the headwaters of the Missouri and Mississippi rivers and in portions of the upper Lake region and northern New England. Elsewhere there was very generally less ice than was reported last week, especially in the lower Lake region and in the lower portions of the Hudson and Connecticut rivers.

But little ice is now reported on the harbors of the lower Lakes and none is reported on the Ohio and its principal tributaries or on the rivers of the Atlantic coast south of the Hudson.

The following special reports have been received:

Hartford, Conn., February 3.—In the lower portion of the Connecticut Valley the ground is practically bare. The depth of snow over the upper portion averages 8 inches, the greatest depth reported being 14 inches at St. Johnsbury, Vt.

Albany, N. Y., February 3.—The snow in the Hudson Valley ranges from a trace at Coxsackie to 10 inches deep at Corinth; in the Mohawk Valley it averages 2 inches deep. The ice in the Hudson River averages 8 inches, and in the Mohawk River 9 inches in thickness.

Binghamton, N. Y., February 3.—The snow in the Chenango Valley averages 3 inches deep, in the Unadilla and upper Susquehanna 2 inches deep, and in the

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., FEBRUARY 2, 1914.

| Stations. | Show. Inches | Ice In rivers, etc. Inches | Stations. | Show. Inches | Ice In rivers, etc. Inches | Stations. | Show. Inches | Ice In rivers, etc. Inches |
|--------------------|------------------|----------------------------------|--------------------------|-----------------|----------------------------------|-----------------------|-----------------|----------------------------------|
| Arizona. | Flagstaff..... | 4..... | Michigan—Cont'd. | Houghton..... | 18..... | New York—Cont'd. | Oswego..... | T..... |
| Connecticut. | Hartford..... | 0..... | Iron Mountain..... | 2..... | 11.0 | Oxford..... | T..... | 11.5 |
| West Cornwall. | T..... | | Iron River..... | 6..... | | Plattsburg..... | T..... | |
| Idaho. | Liquid..... | | Ironwood..... | 8..... | | Poughkeepsie..... | T..... | |
| Pocatello..... | 1..... | | Ludington..... | 6..... | * | Rochester..... | T..... | 0.0 |
| Illinois. | Bloomington..... | 3..... | Marquette..... | 15..... | 2.0 | Saranac Lake..... | T..... | 12..... |
| Charleston..... | 1..... | | Newberry..... | 7..... | | Syracuse..... | T..... | |
| Chicago..... | 6..... | | Port Huron..... | 2..... | 5.0 | Watertown..... | T..... | 2..... |
| Danville..... | 1..... | | Rock..... | 6..... | | North Dakota. | | |
| Du Quoin..... | T..... | | Saginaw..... | 17..... | 5.0 | Bismarck..... | 2..... | 24.0 |
| Dwight..... | 4..... | | Sault Ste. Marie..... | 14..... | 10.5 | Devils Lake..... | 5..... | |
| Joliet..... | 5..... | | South Haven..... | 12..... | | Williston..... | 2..... | 26.0 |
| Olney..... | 2..... | | Minnesota. | | | Ohio. | | |
| Peoria..... | 2..... | 0.0 | Angus..... | 3..... | | New Bremen..... | 1..... | |
| Rockford..... | 3..... | | Duluth..... | 6..... | 14.0 | Sandusky..... | T..... | * |
| Springfield..... | 4..... | | Fergus Falls..... | 2..... | | Tiffin..... | 1..... | |
| Indiana. | Bloomington..... | T..... | Fort Ripley..... | 5..... | | Toledo..... | 4..... | 0.5 |
| Fort Wayne..... | 4..... | | Grand Meadow..... | T..... | | Pennsylvania. | | |
| Indianapolis..... | T..... | | Hinekley..... | 8..... | | Center Hall..... | 4..... | |
| Knox. | 6..... | | International Falls..... | 11..... | | Cresson..... | 4..... | |
| La Fayette..... | 1..... | | Mankato..... | T..... | | Drifton..... | 1..... | |
| Marion..... | T..... | | Milan..... | 1..... | | Emporia..... | T..... | |
| Poiphil..... | T..... | | Minneapolis..... | T..... | | Erie..... | T..... | 0.0 |
| Richmond..... | 1..... | | Moorhead..... | 2..... | 24.0 | Franklin..... | 2..... | |
| Terre Haute..... | T..... | 0.0 | St. Paul..... | T..... | 10.5 | Johnsonburg..... | 3..... | |
| Winona Lake..... | 6..... | | State Sanatorium..... | 9..... | | Lawrenceville..... | 2..... | |
| Iowa. | Des Moines..... | 0..... | Winton..... | 10..... | * | South Dakota. | | |
| Dubuque..... | T..... | 8.0 | Missouri. | | | Huron..... | 0..... | 17.0 |
| Esterville..... | T..... | 4.0 | Brunswick..... | 1..... | | Pierre..... | 0..... | 15.5 |
| Sioux City..... | T..... | 10.0 | Ironton..... | 1..... | | Utah. | | |
| Maine. | Bangor..... | 4..... | Pacific..... | 2..... | | Modena..... | 2..... | |
| Cornish..... | 9..... | | Rolla..... | T..... | | Salt Lake City..... | 1..... | |
| Eastport..... | 1..... | 0.0 | St. Louis..... | T..... | 0.0 | Vermont. | | |
| Gardiner..... | 6..... | | Springfield..... | T..... | | Bellows Falls..... | 7..... | |
| Greenville..... | 28..... | 15.0 | Trenton..... | 1..... | | Brattleboro..... | 6..... | 6.0 |
| Lewiston..... | 7..... | 15.2 | Miles City..... | 8..... | | Burlington..... | 2..... | † |
| Orono..... | 6..... | | Nebraska. | | | Northfield..... | 18..... | |
| Portland..... | 3..... | 0.0 | Omaha..... | 0..... | * | St. Johnsbury..... | 14..... | |
| Van Buren..... | 34..... | | Nevada. | | | Wells River..... | 10..... | |
| Massachusetts. | Adams..... | 4..... | Ren..... | T..... | † | White River Junc..... | 5..... | |
| Concord..... | T..... | | Bethlehem..... | 10..... | | Wisconsin. | | |
| Fitchburg..... | T..... | | Concord..... | 8..... | 20.0 | Ashland..... | 4..... | |
| Turners Falls..... | 4..... | | Durham..... | 3..... | | Eau Claire..... | 1..... | |
| Michigan. | Alpena..... | 14..... | Hanover..... | 12..... | | Hancock..... | 1..... | |
| Battle Creek..... | 8..... | 2.0 | Keene..... | 5..... | | Koepenek..... | 3..... | |
| Big Rapids..... | 8..... | | New Jersey. | | | La Crosse..... | 0..... | 18.5 |
| Cadillac..... | 7..... | | Trenton..... | 0..... | † | Lake Mills..... | 1..... | |
| Calumet..... | 17..... | | Albany..... | 2..... | | Madison..... | 2..... | |
| Chatham..... | 10..... | | Buffalo..... | 4..... | † | Medford..... | 5..... | |
| Detroit..... | 5..... | 7.0 | Canton..... | 3..... | | Milwaukee..... | 2..... | 0.0 |
| Escanaba..... | 6..... | 12.0 | Lake Placid..... | 30..... | | New London..... | 2..... | |
| Grand Haven..... | 6..... | | Lowville..... | 15..... | | Racine..... | 2..... | |
| Grand Rapids..... | 9..... | | Malone..... | 4..... | | Sheboygan..... | 2..... | |
| Harrisville..... | 10..... | | Ogdensburg..... | 7..... | | Spooner..... | 3..... | |
| | | | | | | Wausau..... | 3..... | |

*Shore ice. † Floating ice. T. indicates trace.

Toughnoga only 1 inch deep, the greatest depth reported being 8 inches at Richfield Springs, N. Y.

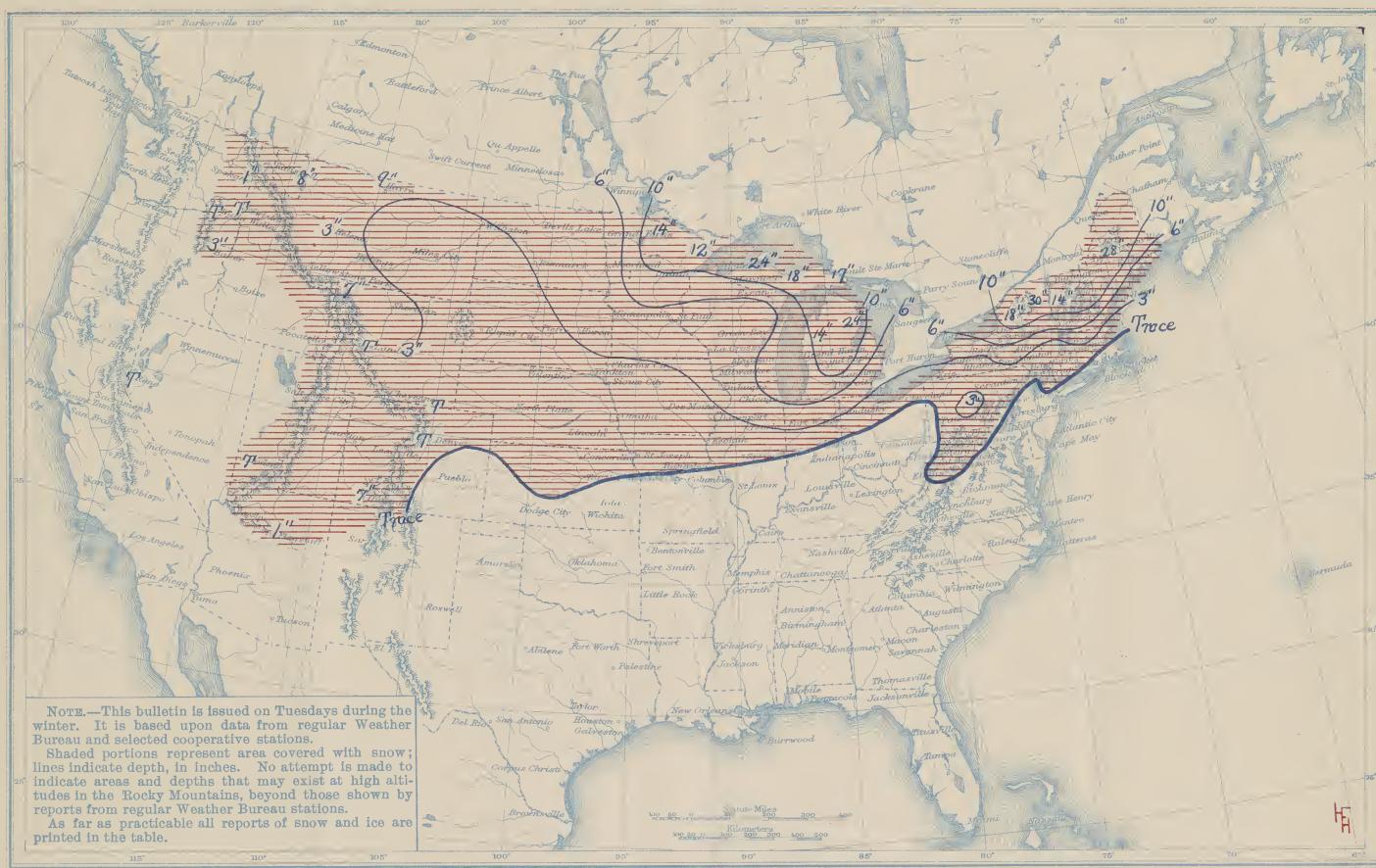
Dubuque, Iowa, February 2.—The Mississippi River is open in many places in this section. Where it is frozen the ice is from 3 to 9 inches thick.

P. O. DAY, Climatologist and Chief of Division.

CHARLES F. MARVIN, CHIEF.

FEB 2

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., February 10, 1914.

DEPTH OF SNOW.

Local snows occurred rather frequently during the early part of the week over the more northerly districts, but the amounts were generally light.

During Thursday and Friday an extensive storm developed over the Southwest and moved rapidly beyond the Lake region by Saturday morning and to the Maritime Provinces of Canada during the next 24 hours. This storm gave general and heavy rains over the more eastern and southeastern portions of the country, and snow, in some cases moderately heavy, over much of the northern and central States to eastward of the Rocky Mountains. Aside from the snowfall accompanying the last-named storm, but little snow occurred during the week over the middle and none over the southern portions of the country.

The area now covered with an appreciable amount of snow is not materially different from that of last week, save in portions of the middle Plains region, where the ground was then bare, but now has a slight covering.

The northern portion of the winter wheat belt had a slight covering during the rather severe cold of the latter part of the week.

The upper Lake region now has a covering ranging from 6 inches in the more southern portions to near 2 feet in depth over the more northerly portions, and the upper Mississippi Valley as well as portions of the Missouri Valley has considerably more snow than at any preceding period during the winter.

Small amounts of snow disappeared during the week over central Illinois, central Indiana, northern Ohio, and at points in Pennsylvania, New York, and New England, as well as in the southern Plateau region.

No general snow appears to have occurred in the mountain ranges of the West, save in the extreme northern portions.

ICE IN RIVERS AND HARBORS.

Moderately cold weather prevailed throughout much of the week just ended in the more northern districts, extending into the middle and southern districts during the latter part. As a result there has been a very general increase in the amount of ice covering the rivers and lakes over that reported one week ago.

In the upper Missouri and Mississippi rivers and their tributaries there was an increase of from 2 to 5 inches or more. The ice in the Missouri now ranges from 7 inches at Omaha to 28 inches at Bismarck and in the Mississippi from 6 inches at Keokuk to 16 inches at St. Paul, and floating ice is reported as far south as Cairo.

There was a general increase in the amount of ice reported from the Lake region, and the harbors are now mostly covered, the thickness ranging from about 6 inches in the lower Lakes to 10 or 15 inches in the upper Lakes. Likewise in New England and New York the ice thickness increased somewhat, although the occurrence of rain during the latter half of the week reduced the thickness in a few localities.

Floating ice is reported from the headwaters of the Ohio as well as on some of the streams of the Middle Atlantic States southward of the Hudson.

Compared with last year at the same period there is now about the same amount of ice as was reported then.

The following special reports have been received:

Hartford, Conn., February 10.—In the lower portion of the Connecticut Valley the snow averages 1 inch and in the upper portion 7 inches in depth. The ice in the Connecticut River is practically unchanged.

Albany, N. Y., February 10.—The snow in the Hudson Valley ranges from a trace at Coxsackie to 11 inches deep at Thrunderman; in the Mohawk Valley it averages 8 inches deep. In the rivers the ice averages 8 inches thick.

Pittsburgh, Pa., February 9.—Along the main streams tributary to the upper Ohio River there is less than 1 inch of snow on the ground, while in the eastern mountains the depth ranges from 2 to 6 inches. The streams are falling, with moderately heavy ice running in the Allegheny River.

P. C. DAY, Climatologist and Chief of Division.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., FEBRUARY 9, 1914.

| Stations. | Snow. Inches | Ice In rivers, har- bors, etc. | Stations. | Snow. Inches | Ice In rivers, har- bors, etc. | Stations. | Snow. Inches | Ice In rivers, har- bors, etc. |
|----------------|-----------------|--------------------------------------|-------------------|-----------------|--------------------------------------|------------------|-----------------|--------------------------------------|
| Colorado. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | Ohio. | Inches | Inches |
| Denver | T. | 7 | Manistee | 6 | | Ashland | T. | |
| Durango | | | Marquette | 18 | 3.0 | Cleveland | T. | * |
| Connecticut. | | | Port Huron | 2 | 10.0 | New Bremen | T. | |
| Hartford | T. | 0.0 | Saginaw | 10 | 10.0 | Sandusky | T. | 4.0 |
| Hawleyville | T. | | Sault Ste. Marie | 17 | 12.0 | Tiffin | T. | |
| West Cornwall | T. | | South Haven | 9 | | Toledo | 1 | 4.0 |
| Idaho. | | | Minnesota. | | | Wauseon | 5 | |
| Lewiston | T. | *† | Angus | 4 | | Oregon. | | |
| Illinois. | | | Collegeville | 6 | | Baker | 3 | |
| Bloomington | 1 | | Fort Ripley | 6 | | Pennsylvania. | | |
| Cairo | 0 | † | Grand Meadow | 4 | | Bloomsburg | T. | |
| Chicago | 7 | | Internation Falls | 14 | | Center Hall | 2 | |
| Danville | T. | | Mankato | 4 | | Clarion | T. | |
| Dwight | 3 | | Milan | 3 | | Confluence | 1 | |
| Springfield | 2 | | Minneapolis | 2 | | Cresson | 6 | |
| Indiana. | | | Moorhead | 4 | 26.0 | Dritton | 3 | |
| Fort Wayne | 3 | | Reeds | 3 | | Erie | T. | 4.0 |
| Knox | 5 | | St. Paul | 2 | 16.0 | Harrisburg | T. | † |
| Marion | 1 | | State Sanatorium | 10 | | Huntingdon | 2 | |
| Terra Haute | 0 | 4.0 | Winton | 12 | | Hyndman | 2 | |
| Winona Lake | 4 | | Worthington | 4 | | Johnstown | 2 | |
| Iowa. | | | Missouri. | | | Parkers Landing | 1 | |
| Charles City | 2 | | Brunswick | 1 | | Pittsburgh | T. | † |
| Creston | T. | | Hannibal | T. | *† | Saltsburg | T. | |
| Davenport | 3 | 3.0 | Kansas City | 0 | †† | Towanda | T. | |
| Des Moines | 2 | 11.5 | St. Louis | T. | † | Warren | 1 | |
| Dubuque | 4 | 8.0 | Springfield | T. | | West Newton | T. | |
| Estherville | 3 | | Montana. | | | Rhode Island. | | |
| Iowa City | 2 | | Billings | T. | | Providence | T. | 0.0 |
| Keokuk | 0 | 6.0 | Havre | 9 | | South Dakota. | | |
| New Hampton | 2 | | Helena | 3 | | Huron | 3 | 19.5 |
| Sioux City | 1 | 14.5 | Kalispell | 8 | | Pierre | 2 | 18.5 |
| Kansas. | | | Miles City | 1 | | Rapid City | 1 | |
| Concordia | T. | | Nebraska. | | | Yankton | 2 | 15.0 |
| Ellinwood | T. | | North Platte | T. | | Utah. | | |
| Manhattan | T. | | Omaha | 1 | 7.0 | Modena | T. | |
| Wakeeney | T. | | Valentine | T. | | Vermont. | | |
| Maine. | | | Nevada. | | | Bellows Falls | 8 | |
| Bangor | 6 | 17.0 | Reno | T. | 0.0 | Battleboro | 6 | 15.0 |
| Cornish | 12 | | Bethlehem | 9 | | Burlington | 1 | *† |
| Eastport | 1 | 0.0 | Concord | 8 | 22.0 | Northfield | 13 | |
| Greenville | 28 | 22.0 | Durham | 5 | | St. Johnsbury | 11 | |
| Lewiston | 10 | 16.0 | Hanover | 10 | | Wells River | 8 | |
| Millinocket | 27 | | Keene | 5 | | White River June | 3 | |
| Orono | 6 | | New Jersey. | | | Virginia. | | |
| Portland | 6 | 0.0 | Newton | T. | | Mount Weather. | T. | |
| Massachusetts. | | | Trenton | 0 | *† | Washington. | | |
| Amherst | 1 | | New York. | | | Spokane | 1 | |
| Boston | 1 | | Addison | 1 | | Walla Walla | T. | |
| Concord | 3 | | Albany | T. | 1.5 | West Virginia. | | |
| Fitchburg | 4 | | Binghamton | T. | | Elkins | T. | * |
| Mansfield | 1 | | Bouckville | 3 | | Glenville | 1 | |
| Turners Falls | 5 | | Buffalo | 5 | 6.0 | Wisconsin. | | |
| Michigan. | | | Canton | 3 | | Ashland | 6 | |
| Alpena | 14 | 5.0 | Herkimer | 2 | | Eau Claire | 4 | |
| Ann Arbor | 2 | | Lowell | 18 | | Green Bay | 3 | 9.5 |
| Battle Creek | 10 | | Malone | 1 | | Hancock | 3 | |
| Big Rapids | 6 | | Ogdensburg | 12 | | La Crosse | 4 | 15.0 |
| Cadillac | 14 | | Oscego | 7 | 12.5 | Lake Mills | 6 | |
| Calumet | 26 | | Oxford | 5 | | Madison | 6 | |
| Chatham | 18 | | Rochester | 3 | 3.0 | Medford | 6 | |
| Detroit | 4 | 9.0 | Rome | 10 | | Milwaukee | 6 | 0.0 |
| Escanaba | 5 | 14.0 | Saranac Lake | 10 | | Mount Horeb | 5 | |
| Grand Haven | 8 | | Watertown | 5 | | New London | 4 | |
| Grand Rapids | 12 | | Watkins | T. | | Racine | 4 | |
| Harrissville | 24 | | | | | Spooner | 5 | |
| Houghton | 24 | 11.5 | | | | Wyoming. | | |
| Iron River | 8 | | North Dakota. | | | Cheyenne | T. | |
| Ironwood | 14 | | Bismarck | 3 | 28.0 | Lander | T. | |
| Lansing | 10 | | Devils Lake | 4 | | Sheridan | 4 | |
| Ludington | 8 | † | Williston | 2 | 28.0 | Yellowstone Park | 7 | |

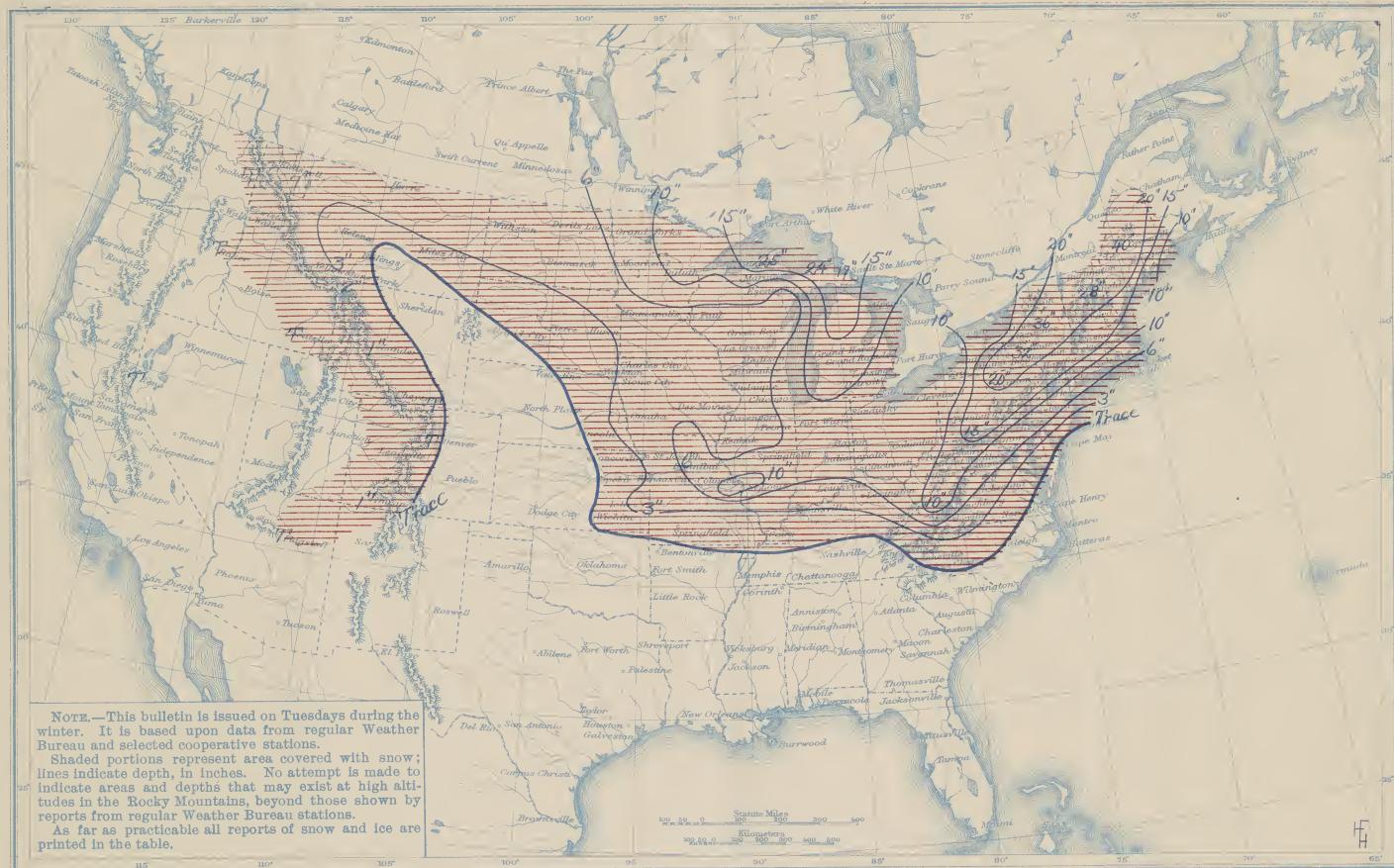
*Shore ice.

† Floating ice.

‡ Ice gorged above.

T. indicates trace.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., February 17, 1914.

DEPTH OF SNOW.

Light snow occurred during the early part of the week over the Lake region and portions of the North Atlantic States as well as in the northern Mountain regions.

About the middle of the week a considerable storm area developed over the Southwest, which, by Friday morning, had moved to the middle Mississippi Valley. Heavy local rains occurred in connection with this storm over portions of the Gulf States and snow and sleet occurred in the States to northward. This storm probably merged with one that moved from the east Gulf States to the New Jersey coast by Saturday morning, where it prevailed as a severe storm, moving rapidly during the following 24 hours to the northeastward. Heavy snow occurred over portions of the Middle Atlantic States and New England and high winds caused much drifting. Country roads were badly blocked, and steam and electric traffic was delayed to some extent.

A considerable body of snow now covers the country from the middle and upper Mississippi Valley eastward, the amount being heaviest in the Middle Atlantic States and New England, where the depths range from 6 inches to 3 feet or more. The States of the Ohio Valley are generally well covered, as well as other portions of the winter wheat area as far west as the eastern portions of Kansas and Nebraska. The extreme western portion of the winter wheat belt has had little or no snow protection during the recent cold weather.

Only small amounts of snow appear to have occurred during the week in the mountainous portions of the West, and several inches disappeared at the lower levels in the northern districts.

A moderate depth of snow now covers the Lake region, and lumbering operations, delayed in the earlier portions of the winter on account of insufficient snow covering, can now be prosecuted.

ICE IN RIVERS AND HARBORS.

Temperatures below the normal continued throughout the week over practically all portions of the country to eastward of the Rocky Mountains, and they were especially low over the Lake region and New England about the middle of the week. As a result of the continued cold there was a general increase in the amount of ice in all rivers and lakes in the northern districts and considerable ice formed on streams in other portions of the country that have so far this winter remained open.

Heavy ice now covers the upper portions of the Missouri and Mississippi rivers and their northern tributaries, and it ranges from 8 to nearly 20 inches in thickness on the harbors of the Lake region. In New England there has been a general increase of from 2 to 10 inches, and the headwaters of the Ohio are ice bound as well as the smaller streams of the Middle Atlantic States.

The following special reports have been received:

New Haven, Conn., February 16.—The ice in the harbor is 6 inches thick, but the channels are open.

Albany, N. Y., February 17.—In the Hudson Valley, as far as reports received indicate, the snow ranges in depth from 20 inches at Coeymans to 41 inches at Corinth. The snow in the Mohawk Valley averages 28 inches deep. The ice in the Hudson and Mohawk rivers averages about 10 inches thick.

Binghamton, N. Y., February 17.—In the watersheds of this vicinity the snow averages about 25 inches deep, the greatest depth reported being 33 inches at Richfield Springs, N. Y.

Pittsburgh, Pa., February 16.—The tributaries are frozen at practically all points above Pittsburgh, with ice gorges in the Allegheny River below Freeport and Parkers Landing.

Hannibal, Mo., February 16.—The channel in the Mississippi River is open below the bridge.

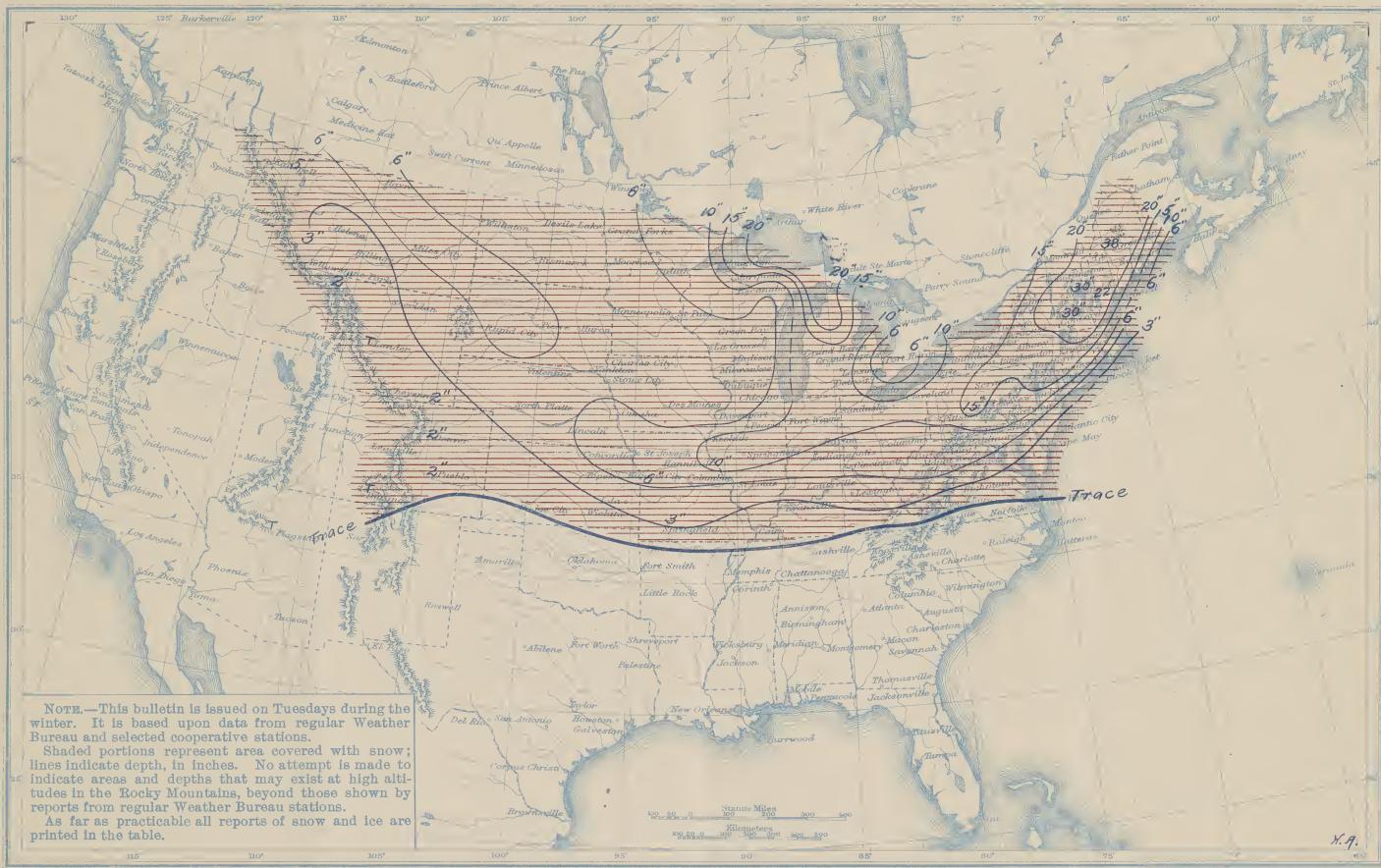
P. C. DAY, Climatologist and Chief of Division.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., FEBRUARY 16, 1914.

| Stations. | Snow. | Ice in rivers, har- bors, etc. | Stations. | Snow. | Ice in rivers, har- bors, etc. | Stations. | Snow. | Ice in rivers, har- bors, etc. |
|---------------------|--------|---|--------------------------|--------|---|-----------------------|--------|---|
| Colorado. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | Ohio—Cont'd. | Inches | Inches |
| Denver..... | T. | | Ironwood..... | 15 | | Marion..... | 6 | |
| Durango..... | 1 | | Lansing..... | 9 | | Philo..... | 6 | |
| Connecticut. | | | Ludington..... | 9 | † | Sandusky..... | 3 | 9.5 |
| Hartford..... | 19 | 2.5 | Marquette..... | 18 | * | Toledo..... | 2 | 8.5 |
| New Haven..... | 13 | 6.0 | Newberry..... | 12 | | Wauseon..... | 6 | |
| West Cornwall..... | 15 | | Port Huron..... | 3 | 15.0 | Waverly..... | 9 | |
| Distr. of Columbia. | | | Saginaw..... | 11 | 12.5 | Youngstown..... | 6 | |
| Washington..... | 5 | 4.5 | Sault Ste. Marie..... | 17 | 16.0 | Oregon. | | |
| Illinois. | | | South Haven..... | 12 | | Baker..... | T. | |
| Bloomington..... | 4 | | Minnesota. | | | Pennsylvania. | | |
| Cairo..... | 2 | * | Duluth..... | 6 | 22.0 | Clarion..... | 10 | |
| Chicago..... | 6 | | Fergus Falls..... | 6 | | Drifton..... | 10 | |
| Danville..... | 6 | | Fort Ripley..... | 7 | | Emporium..... | 16 | |
| Monmouth..... | 5 | | Hineckley..... | 10 | | Erie..... | 4 | 8.5 |
| Olney..... | 5 | | International Falls..... | 10 | | Franklin..... | 6 | |
| Peoria..... | 3 | 7.0 | Moorhead..... | 5 | 28.0 | Greensboro..... | 5 | |
| Springfield..... | 7 | | State Sanatorium..... | 9 | | Greenville..... | 5 | |
| Indiana. | | | Missouri. | | | Harrisburg..... | 11 | † |
| Bloomington..... | 5 | | Columbia..... | 5 | | Huntingdon..... | 15 | |
| Evansville..... | 3 | 0.0 | Hannibal..... | 4 | 8.0 | Johnstown..... | 19 | |
| Fort Wayne..... | 5 | | Ironton..... | 3 | | Lawrenceville..... | 22 | |
| Indianapolis..... | 6 | | Kansas City..... | 2 | ** | Parkers Landing..... | 9 | |
| Knox..... | 6 | | St. Louis..... | 10 | † | Philadelphia..... | 5 | 2.0 |
| Marion..... | 6 | | Springfield..... | 1 | | Pittsburgh..... | 10 | † |
| Paoli..... | 6 | | Trenton..... | 3 | | Reading..... | 12 | |
| Térre Haute..... | 6 | 8.0 | Montana. | | | Ridgway..... | 9 | |
| Iowa. | | | Helena..... | 3 | | Scranton..... | 14 | |
| Charles City..... | 3 | | Kalispell..... | 7 | | Somerset..... | 20 | |
| Davenport..... | 4 | | Miles City..... | T. | | Stroudsburg..... | 15 | |
| Des Moines..... | 5 | 12.5 | Nebraska. | | | Towanda..... | 20 | |
| Dubuque..... | 4 | 12.0 | Omaha..... | 7 | | Warren..... | 7 | |
| Estherville..... | 4 | | Nevada. | | | Rhode Island. | | |
| Keokuk..... | 4 | 8.0 | Montana. | | | Block Island..... | 5 | * |
| Sioux City..... | T. | 15.5 | Nebraska. | | | Naragansett Pier..... | 13 | |
| Waterloo..... | 7 | | Nebraska. | | | Priyidence..... | 12 | † |
| Kansas. | | | Nebraska. | | | South Dakota. | | |
| Iola..... | 3 | 2.0 | Reno..... | T. | 0.0 | Huron..... | 2 | 20.5 |
| Wichita..... | T. | | New Hampshire. | | | Pierre..... | 1 | 22.0 |
| Kentucky. | | | Bethlehem..... | 22 | | Yankton..... | T. | 18.0 |
| Beattyville..... | 4 | | Concord..... | 18 | 24.0 | Vermont. | | |
| Burlington..... | 2 | | Durham..... | 18 | | Brattleboro..... | 17 | 16.0 |
| Hopkinsville..... | 1 | | Hanover..... | 24 | | Burlington..... | 7 | 11.0 |
| Lexington..... | 4 | | New Jersey. | | | Northfield..... | 25 | |
| Louisville..... | 4 | † | Atlantic City..... | 1 | † | St. Johnsbury..... | 22 | |
| Maysville..... | 6 | | Bridgeton..... | 4 | | Wells River..... | 28 | 30.0 |
| Owensboro..... | 2 | | Cape May..... | T. | 3.0 | Virginia. | | |
| Maine. | | | Long Branch..... | 6 | † | Culpeper..... | 6 | |
| Bangor..... | 16 | 21.0 | Phillipsburg..... | 10 | | Danville..... | 3 | |
| Cornish..... | 24 | | Trenton..... | 10 | 8.0 | Fredericksburg..... | 4 | * |
| Eastport..... | 5 | 0.0 | New York. | | | Lynchburg..... | 3 | * |
| Gardiner..... | 26 | 21.0 | Albany..... | 23 | 6.0 | Mount Weather..... | 7 | 0.0 |
| Greenville..... | 40 | 30.0 | Binghamton..... | 16 | | Richmond..... | 1 | 0.0 |
| Lewiston..... | 22 | 17.0 | Buffalo..... | 7 | 11.0 | Staunton..... | 7 | |
| Millinocket..... | 34 | | Buffalo..... | 5 | | Woodstock..... | 6 | |
| Portland..... | 20 | 0.0 | Canton..... | 25 | | Wytheville..... | 10 | |
| Maryland. | | | Herkimer..... | | | West Virginia. | | |
| Baltimore..... | 4 | * | Ithaca..... | 17 | | Burlington..... | 10 | |
| Easton..... | 3 | | New York..... | 12 | | Elkins..... | 7 | 3.0 |
| Frederick..... | 8 | | Ogdensburg..... | 16 | | Fairmont..... | 6 | |
| Princess Anne..... | 1 | | Oswego..... | 12 | 18.5 | Hinton..... | 12 | |
| Massachusetts. | | | Oxford..... | 22 | | Huntington..... | 5 | |
| Boston..... | 10 | | Poughkeepsie..... | 14 | | Parkersburg..... | 5 | † |
| Pittsburg..... | 17 | | Rochester..... | 11 | 4.0 | Wisconsin. | | |
| Nantucket..... | 4 | † | Rome..... | 36 | | Ashland..... | 7 | |
| Turners Falls..... | 15 | 19.0 | Syracuse..... | 12 | | Eau Claire..... | 5 | |
| Michigan. | | | North Carolina. | | | Green Bay..... | 4 | 11.0 |
| Alpena..... | 13 | 10.5 | Asheville..... | T. | | La Crosse..... | 4 | 16.0 |
| Battle Creek..... | 11 | | Charlotte..... | T. | | Lake Mills..... | 6 | |
| Cadillac..... | 15 | | Raleigh..... | 1 | | Madison..... | 5 | |
| Calumet..... | 23 | | North Dakota. | | | Medford..... | 6 | |
| Chatham..... | 24 | | Bismarck..... | 3 | 32.0 | Milwaukee..... | 4 | 0.0 |
| Detroit..... | 4 | 11.0 | Devils Lake..... | 4 | | New London..... | 2 | |
| Escanaba..... | 5 | 19.0 | Williston..... | 2 | 27.5 | Racine..... | 5 | |
| Grand Haven..... | 13 | | Ohio. | | | Spooner..... | 6 | |
| Grand Rapids..... | 10 | | Canton..... | 6 | | Wausau..... | 2 | |
| Houghton..... | 25 | 11.5 | Cincinnati..... | 7 | 0.0 | Wyoming. | | |
| Iron Mountain..... | 4 | | Cleveland..... | 4 | 6.5 | Lander..... | 1 | |
| Iron River..... | 8 | | Columbus..... | 9 | | Yellowstone Park..... | 2 | |

* Shore ice. † Floating ice. ‡ Ice gorged above. T. indicates trace.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., February 24, 1914.

DEPTH OF SNOW.

Small amounts of snow occurred over northern districts from the upper Mississippi Valley eastward during the first day of the week just closed, and in other scattered localities during the next day or two. By Thursday a considerable storm area had developed over the middle Gulf States, and heavy rains fell in portions of the Ohio Valley and to the southward, with some snow to the northward. This storm probably merged into one over the South Atlantic States by Friday morning and moved off the Middle Atlantic coast during the following 24 hours, accompanied by some snow in the Appalachian Mountain region. At the same time a storm area approached the Pacific coast and heavy rains fell in California, especially over the southern coast districts, and snow extended eastward into the mountain regions.

During the latter part of the week a storm of considerable magnitude moved rapidly from the central Rocky Mountain regions eastward to the middle Atlantic coast. Snow occurred with this storm from the Plains region eastward, becoming heavy in portions of the middle Mississippi and Ohio valleys, and the Appalachian Mountain districts. In portions of the West the storm was the severest of the season, high winds, drifting snow, and severe cold greatly interfering with traffic and causing much suffering.

A good covering of snow now prevails throughout the greater part of the winter wheat region and all northern and central districts from the Rocky Mountains eastward are well covered. In portions of the Mississippi and Ohio valleys, as well as in portions of the Atlantic Coast States there is somewhat less snow than at the end of the preceding week, but in the Plain States, the Missouri Valley, and in portions of Illinois, Indiana, Ohio, and the lower Lake region the depths are now from 3 to 6 inches, or more, greater.

Small increases are reported at points in the Rocky Mountain regions, but to the westward there appears to have been but little snow at the lower elevations; there were probably considerable additions in the higher elevations, however, especially in the Sierra and other mountains of the far West.

ICE IN RIVERS AND HARBORS.

Temperatures very generally below the normal continued during the week over most districts from the Rocky Mountains eastward, and at the close an extensive cold wave had overspread the northern and central districts. As a result there was a very general increase in the amount of ice on the rivers and lakes of all northern districts. In the central districts a change to warmer weather about the middle of the week caused the disappearance of some ice that had formed during the preceding week and the early part of the week just ended, but a considerable thickness had accumulated on the smaller streams and ponds, and much ice was housed in the rural districts. Ice from 1 to nearly 3 feet in thickness now covers the Missouri River and its tributaries from Omaha northward, and somewhat less amounts cover the streams of the Mississippi Valley to the northward of Hannibal. A general increase of from 2 to 4 inches is reported from the Lake region and practically all the harbors are now icebound, the thickness ranging from about 1 foot on the lower Lakes to nearly 2 feet at points on the upper Lakes. Heavy ice covers the streams and ponds of New England, but there is still little on the main streams of the Atlantic coast south of the Hudson or on the Ohio below Pittsburgh.

The following special reports have been received:

Hartford, Conn., February 24.—The snow in the Connecticut Valley averages 18 inches deep. At the majority of stations there has been a slight increase in the depth since last week.

Albany, N. Y., February 24.—The snow in the Hudson Valley averages 23 inches deep and in the Mohawk 21 inches deep, the greatest depth reported being 32 inches at Trenton Falls, N. Y. The ice in the Hudson River averages 18 inches and in the Mohawk 12 inches thick.

Binghamton, N. Y., February 24.—The snow in the Unadilla and Tioughnioga valleys averages 17 inches deep, in the upper Susquehanna 19, and the Chenango 23, the greatest depth reported being 30 inches at Schenevus, N. Y.

Hannibal, Mo., February 23.—Below the bridge the channel of the Mississippi River continues open.

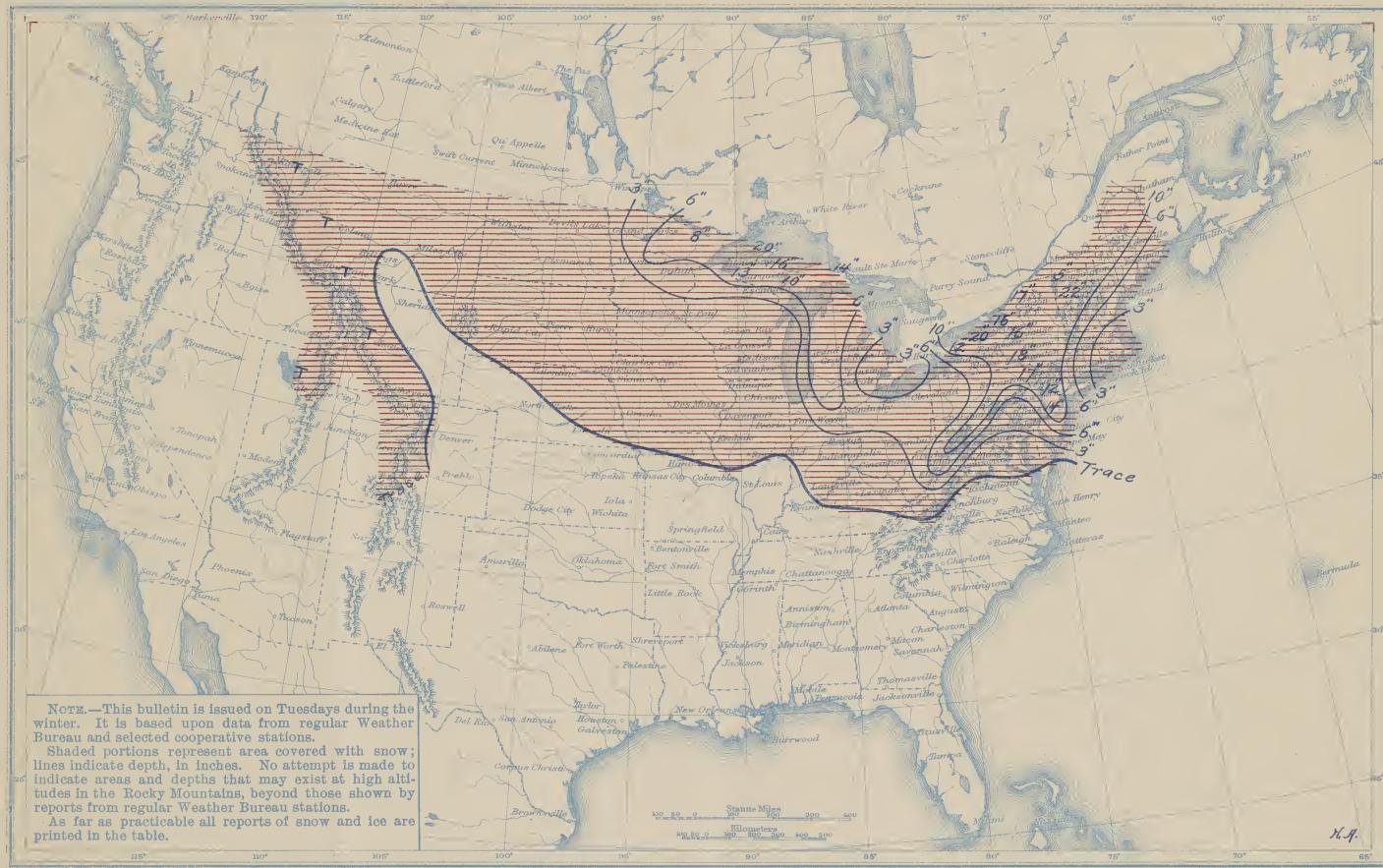
DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., FEBRUARY 23, 1914.

| Stations. | Snow. | Ice in rivers, har- bors, etc. | Stations. | Snow. | Ice in rivers, har- bors, etc. | Stations. | Snow. | Ice in rivers, har- bors, etc. |
|---------------------------|--------|--|--------------------------|--------|--|-----------------------|--------|--|
| Arizona. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | Ohio. | Inches | Inches |
| Flagstaff..... | T. | | Grand Haven..... | 11 | | Ashland..... | 12 | |
| Arkansas. | | | Grand Rapids..... | 11 | | Cincinnati..... | 8 | 0.0 |
| Bentonville..... | T. | | Houghton..... | 20 | 15.0 | Cleveland..... | 9 | 11.0 |
| Colorado. | | | Iroquois Mountain..... | 4 | | Columbus..... | 6 | |
| Denver..... | 2 | | Bronwood..... | 16 | | Dayton..... | 9 | |
| Durango..... | T. | | Lansing..... | 9 | | Hiram..... | 15 | |
| Pueblo..... | 2 | | Ludington..... | 8 | † | Marion..... | 12 | |
| Connecticut. | | | Manistee..... | 22 | | Philo..... | 5 | |
| Harford..... | 17 | 6.0 | Marquette..... | 20 | 2.5 | Sandusky..... | 7 | 18.0 |
| Hawleyville..... | 14 | | Port Huron..... | 5 | 17.5 | Tiffin..... | 12 | |
| New Haven..... | 8 | 6.0 | Saginaw..... | 11 | 16.0 | Toledo..... | 6 | 12.0 |
| West Cornwall..... | 18 | | Sault Ste. Marie..... | 20 | 16.5 | Waverly..... | 5 | |
| <i>Dist. of Columbia.</i> | | | South Haven..... | 10 | | Youngstown..... | 6 | |
| Washington..... | 5 | * | Minnesota. | | | Pennsylvania. | | |
| <i>Illinois.</i> | | | Angus..... | 5 | | Clarion..... | 12 | |
| Cairo..... | T. | † | Collegeville..... | 5 | | Erie..... | 7 | 10.5 |
| Chicago..... | 7 | | Duluth..... | 6 | 23.0 | Franklin..... | 9 | |
| Dwight..... | 3 | | Fergus Falls..... | 4 | | Greenville..... | 14 | |
| Peoria..... | 7 | 10.5 | Grand Meadow..... | 6 | | Harrisburg..... | 12 | † |
| Springfield..... | 11 | | International Falls..... | 9 | | Huntingdon..... | 8 | |
| Walnut..... | 3 | | Mankato..... | 4 | | Hyndman..... | 8 | |
| <i>Indiana.</i> | | | Minneapolis..... | 2 | | Johnstown..... | 8 | |
| Evansville..... | 2 | 0.0 | Moorhead..... | 5 | 33.0 | Meadville..... | 12 | |
| Fort Wayne..... | 9 | | Reeds..... | 3 | | Philadelphia..... | 4 | 2.5 |
| Indianapolis..... | 8 | | St. Paul..... | 2 | 17.5 | Pittsburgh..... | 10 | 0.0 |
| Marion..... | 15 | | Worthington..... | 6 | | Reading..... | 11 | |
| Terre Haute..... | 6 | 10.0 | <i>Missouri.</i> | | | Ridgway..... | 8 | |
| <i>Iowa.</i> | | | Columbia..... | 2 | | Seranton..... | 10 | |
| Atlantic..... | 5 | — | Hannibal..... | 10 | 6.0 | Somerset..... | 8 | |
| Charles City..... | 2 | | Ironton..... | 1 | | Warren..... | 11 | |
| Davenport..... | T. | 10.0 | Kansas City..... | 8 | † | Rhode Island. | | |
| Des Moines..... | 2 | 11.5 | Rolla..... | 3 | | Block Island..... | 2 | * |
| Dubuque..... | 4 | 14.5 | St. Louis..... | 6 | † | Kingston..... | 15 | |
| Estherville..... | 4 | | Springfield..... | T. | | Naragansett Pier..... | 6 | |
| Keokuk..... | 6 | 10.0 | <i>Montana.</i> | | | Providence..... | 11 | * |
| Sioux City..... | 4 | 15.0 | Havre..... | 6 | | South Dakota. | | |
| <i>Kansas.</i> | | | Helena..... | 2 | | Huron..... | 4 | 21.0 |
| Dodge City..... | T. | | Kalispell..... | 5 | | Pierre..... | 10 | 23.0 |
| Ellinwood..... | T. | | Miles City..... | 8 | | Rapid City..... | 5 | |
| Iola..... | 2 | 0.0 | Nebraska. | | | Yankton..... | 3 | 19.0 |
| Marion..... | 5 | | Lincoln..... | 6 | | Vermont. | | |
| Ottawa..... | 4 | | North Platte..... | 5 | | Bellows Falls..... | 21 | |
| Topeka..... | 8 | | Omaha..... | 7 | 8.0 | Brattleboro..... | 20 | 17.0 |
| Wichita..... | 1 | | Valentine..... | 4 | | Northfield..... | 23 | |
| <i>Kentucky.</i> | | | <i>New Hampshire.</i> | | | Wells River..... | 30 | |
| Beattyville..... | 6 | | Bethlehem..... | 22 | | White River Junc..... | 30 | |
| Lexington..... | 2 | | Concord..... | 21 | 24.0 | <i>Virginia.</i> | | |
| Louisville..... | 8 | 0.0 | Hanover..... | 21 | | Cape Henry..... | T. | 0.0 |
| Maysville..... | 3 | | Keene..... | 16 | | Culpeper..... | 4 | |
| St. John..... | 1 | | <i>New Jersey.</i> | | | Lynchburg..... | 1 | 0.0 |
| <i>Maine.</i> | | | Atlantic City..... | 2 | | Mount Weather..... | 7 | |
| Bangor..... | 18 | 22.0 | Cape May..... | 3 | 2.5 | Richmond..... | 2 | 0.0 |
| Cornish..... | 23 | | Long Branch..... | 2 | | Wytheville..... | 2 | |
| Eastport..... | 2 | 0.0 | Newton..... | 14 | | <i>West Virginia.</i> | | |
| Gardiner..... | 27 | 22.0 | Trenton..... | 8 | 11.0 | Bayard..... | 6 | |
| Greenville..... | 33 | 33.0 | <i>New York.</i> | | | Elkins..... | 6 | 0.0 |
| Lewiston..... | 20 | 19.0 | Addison..... | 12 | | Fairmont..... | 4 | |
| Portland..... | 21 | 0.0 | Albany..... | 14 | 11.0 | Parkersburg..... | 11 | † |
| <i>Maryland.</i> | | | Binghamton..... | 14 | | <i>Wisconsin.</i> | | |
| Baltimore..... | 4 | 0.0 | Buffalo..... | 10 | 13.5 | Ashland..... | 7 | |
| Princess Anne..... | 2 | | Canton..... | 6 | | Green Bay..... | 4 | 12.0 |
| <i>Massachusetts.</i> | | | Herkimer..... | 16 | | Hancock..... | 8 | |
| Amherst..... | 15 | | Ithaca..... | 15 | | Koepenick..... | 9 | |
| Boston..... | 9 | | Lowville..... | 15 | | La Crosse..... | 2 | 17.0 |
| Concord..... | 20 | | New York..... | 6 | | Madison..... | 3 | |
| Fitchburg..... | 21 | | Oswego..... | 10 | 19.0 | Milwaukee..... | 3 | 0.0 |
| Mansfield..... | 12 | | Oxford..... | 14 | | Racine..... | 6 | |
| Nantucket..... | 2 | 4.0 | Poughkeepsie..... | 17 | | Spooner..... | 6 | |
| <i>Michigan.</i> | | | Rochester..... | 11 | 8.0 | <i>Wyoming.</i> | | |
| Alpena..... | 11 | 16.0 | Warwick..... | 20 | | Cheyenne..... | 2 | |
| Big Rapids..... | 11 | | Watertown..... | 12 | | Lander..... | T. | |
| Cadillac..... | 14 | | <i>North Dakota.</i> | | | Sheridan..... | 5 | |
| Calumet..... | 21 | | Bismarck..... | 3 | 35.0 | Yellowstone Park..... | 2 | |
| Detroit..... | 6 | 14.0 | Devils Lake..... | 4 | | | | |
| Escanaba..... | 5 | 20.0 | Williston..... | 1 | 27.0 | | | |

* Shore ice. † Floating ice. ‡ Ice gorged above. T. indicates trace.

MAR 4-1914
U. S. DEPARTMENT OF AGRICULTURE

SNOW AND ICE BULLETIN.



NOTE.—This bulletin is issued on Tuesdays during the winter. It is based upon data from regular Weather Bureau and selected cooperative stations.

Shaded portions represent area covered with snow; lines indicate depth, in inches. No attempt is made to indicate areas and depths that may exist at high altitudes in the Rocky Mountains, beyond those shown by reports from regular Weather Bureau stations.

As far as practicable all reports of snow and ice are printed in the table.

WASHINGTON, D. C., March 3, 1914.

DEPTH OF SNOW.

A considerable storm area central somewhat to the southward of the Ohio River at the first of the week moved eastward to the Atlantic coast by Tuesday, accompanied by generally light snows from the middle Mississippi Valley eastward. During Wednesday a slight disturbance over the east Gulf and south Atlantic States caused an unusual fall of snow in portions of those districts. Nearly a foot of snow occurred at points in the interior of South Carolina, with smaller amounts in portions of Georgia and North Carolina.

But little snow appears to have occurred in other portions of the country during the week until near the close, when a severe storm moved from the Gulf region northeastward along the Atlantic coast, becoming extraordinarily severe during Sunday from the Carolinas to eastern New York, and continuing over the last-named district and New England at the close of the week. During the prevalence of this storm winds of hurricane force prevailed over the coast districts of the Middle Atlantic States and southern New England. Heavy falls of snow occurred in portions of eastern Pennsylvania, New Jersey, and central and eastern New York, the high winds drifting it to such an extent as to completely block railroad communication on numerous important lines in that section. The severe wind greatly damaged telephone and other wires, wrecked buildings, and blocked country roads over a large extent of territory in the districts mentioned.

Despite the facts that no unusually high temperatures occurred during the week, and that but little rain fell except in the Atlantic coast districts, a large amount of snow disappeared even in the far northern districts. As a result only a small portion of the winter wheat belt has any appreciable covering, and but little now remains on the ground in the Missouri Valley, where last week the depth ranged from 4 to 8 inches. In the middle Mississippi and Ohio valleys and Lake region from 5 to 10 inches of snow disappeared, and in New England the snow is now from 10 to 20 inches less than last week, due to the heavy rains of the last few days. The water from this considerable covering of snow appears to have gradually passed into the soil, in the more southern districts at least, with little runoff, except in southern New England where high waters are reported as a result of the heavy rains and melting snow.

No considerable amount of snow appears to have occurred in the mountain regions of the West, and there is little now on the ground at the lower elevations.

ICE IN RIVERS AND HARBORS.

The cold wave referred to in the last issue of this bulletin passed off the Atlantic coast early in the week just ended, and slowly rising temperature prevailed until near the end of the week, when another cold wave overspread most districts to eastward of the Rocky Mountains. This, in connection with a storm that moved northward along the Atlantic coast during the same period, caused the most severe weather experienced over the Atlantic States so late in the season for many years.

The ice conditions remain practically as reported last week, only slight increases or decreases occurring, except in southern New England where the heavy rains at the end of the week appear to have diminished the thickness considerably. Heavy ice continues on the main streams and tributaries of the upper Missouri and Mississippi river systems, and the harbors of the Great Lakes continue ice-bound as a rule. Some ice formed on the streams of the middle Atlantic coast and the northern tributaries of the Ohio, affording still further opportunity for the gathering of a good supply of ice in the districts where it is usually harvested.

The following special reports have been received; that from Detroit relates to the conditions existing throughout the Great Lakes and is a summary of a large number of reports collected at that station:

Binghamton, N. Y., March 3.—The old snow in the watersheds hereabouts is about 10 inches deep and not drifted; the new snow averages about 22 inches deep and is much drifted, some drifts being reported as 20 feet deep.

Detroit, Mich., March 3.—In Lake Superior the ice fields are confined to the extreme western part, the region of Keweenaw Point, and over the eastern por-

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., MARCH 2, 1914.

| Stations. | Show. | Ice in rivers har- bors, etc. | Stations. | Show. | Ice in rivers har- bors, etc. | Stations. | Show. | Ice in rivers har- bors, etc. |
|--------------------|--------|-------------------------------------|----------------------|--------|-------------------------------------|--------------------|--------|-------------------------------------|
| Arizona. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | Ohio—Cont'd. | Inches | Inches |
| Flagstaff. | T. | | Lansing. | 3 | | Haydenville. | 1 | |
| Connecticut. | | | Ludington. | 3 | † | Hiram. | 8 | |
| New Haven. | 3 | 0.0 | Manistee. | 12 | | New Bremen. | 3 | |
| Delaware. | | | Marquette. | 16 | 0.5 | Philo. | 5 | |
| Millsboro. | 3 | | Port Huron. | 1 | 18.0 | Sandusky. | 1 | 13.0 |
| Dist. of Columbia. | | | Rook. | 10 | | Tiffin. | 3 | |
| Washington | 2 | *+ | Saginaw. | 4 | 15.0 | Toledo. | T. | 18.0 |
| Illinois. | | | Sault Ste. Marie. | 14 | 17.5 | Wauseon. | 2 | |
| Chicago. | T. | | South Haven. | 9 | | Waverly. | 1 | |
| Monmouth. | T. | | Minnesota. | | | Pennsylvania. | | |
| Peoria. | 0 | 12.0 | Collegeville. | 1 | | Blosserville. | 16 | |
| Rockford. | T. | | Duluth. | 1 | 25.0 | Erie. | 2 | 8.0 |
| Springfield. | 2 | | Fergus Falls. | T. | | Harrisburg. | 4 | 5.0 |
| White Hall. | 1 | | Fort Ripley. | T. | | Huntington. | 8 | |
| Indiana. | | | Grand Meadow. | T. | | Hyndman. | 2 | |
| Fort Wayne. | 5 | | Hinckley. | 5 | | Philadelphia. | 6 | 3.5 |
| Indianapolis. | 1 | | International Falls. | 2 | | Pittsburgh. | 4 | 6.0 |
| Jeffersonville. | T. | | Mankato. | T. | | Reading. | 17 | |
| Knox. | 2 | | Minneapolis. | T. | | Scranton. | 8 | |
| Marion. | 2 | | Moorhead. | 2 | 34.0 | Sunbury. | 9 | |
| Paoli. | T. | | St. Paul. | T. | 17.0 | Williamsport. | | |
| Richmond. | 4 | | State Sanatorium. | 8 | | Rhode Island. | | |
| Terre Haute. | 0 | 12.0 | Winter. | 8 | | Block Island. | T. | 0.0 |
| Winona Lake. | 6 | | Worthington. | T. | | Narragansett Pier. | T. | * |
| Iowa. | | | Missouri. | | | Providence. | T. | |
| Atlantic City. | T. | | Hannibal. | 1 | 9.0 | South Dakota. | | |
| Charles City. | T. | | Maryville. | T. | | Huron. | T. | 21.5 |
| Davenport. | 0 | 11.0 | Pacific. | T. | | Pierre. | T. | 24.0 |
| Des Moines. | 0 | 14.0 | St. Louis. | T. | † | Rapid City. | T. | |
| Dubuque. | T. | 13.0 | Unionville. | T. | | Yankton. | T. | 19.0 |
| Esterherville. | 1 | | Montana. | | | Utah. | | |
| Koekuk. | T. | 11.0 | Helena. | T. | | Salt Lake City. | T. | |
| Sioux City. | 0 | 14.0 | Kalispell. | T. | | Vermont. | | |
| Kentucky. | | | Nebraska. | | | Brattleboro. | 10 | 20.0 |
| Bubank. | T. | | Auburn. | 2 | | Burlington. | 5 | 13.5 |
| Greensburg. | T. | | Lincoln. | T. | | Northfield. | 22 | |
| Louisville. | T. | 0.0 | Omaha. | 0 | 8.5 | Virginia. | | |
| St. John. | T. | | Valentine. | T. | | Culpeper. | 1 | |
| Maine. | | | York. | T. | | Fredericksburg. | T. | |
| Bangor. | 8 | 21.0 | New Hampshire. | 6 | 26.0 | Richmond. | T. | 0.0 |
| Eastport. | T. | 0.0 | New Jersey. | | | Staunton. | T. | |
| Gardiner. | 9 | 20.0 | Atlantic City. | 13 | | Woodstock. | 2 | |
| Lewiston. | T. | 19.0 | Trenton. | 14 | 16.0 | Wytheville. | T. | |
| Portland. | 4 | 0.0 | New Mexico. | | | West Virginia. | | |
| Maryland. | | | Roswell. | T. | | Bayard. | 16 | |
| Baltimore. | T. | 0.0 | Santa Fe. | T. | | Elkins. | 8 | * |
| Easton. | 2 | | New York. | | | Parkersburg. | 3 | † |
| Boston. | 2 | | Binghamton. | 18 | | Pickens. | 16 | |
| Nantucket. | T. | † | Buffalo. | 12 | 15.0 | Wisconsin. | | |
| Michigan. | | | Canton. | 17 | | Ashland. | 4 | |
| Ann Arbor. | T. | | New York. | 12 | | Eau Claire. | 1 | |
| Battle Creek. | 6 | | Oswego. | 16 | 20.0 | Green Bay. | 0 | 10.5 |
| Big Rapids. | 5 | | Rochester. | 20 | ‡ | Hancock. | T. | |
| Calumet. | 20 | | Syracuse. | 16 | | Koepenick. | 3 | |
| Chatham. | 12 | | North Dakota. | | | La Crosse. | 0 | 17.0 |
| Detroit. | T. | 15.0 | Bismarck. | T. | 35.0 | Lake Mills. | 2 | |
| Escanaba. | T. | 23.0 | Devils Lake. | T. | | Madison. | T. | |
| Grand Haven. | 6 | | Williston. | T. | ‡ | Medford. | 3 | |
| Grand Rapids. | 6 | | Ohio. | | | Milwaukee. | 2 | 0.0 |
| Harrisville. | 4 | | Ashland. | 5 | | Racine. | T. | |
| Houghton. | 11 | 16.0 | Cincinnati. | 1 | † | Wyoming. | | |
| Iron Mountain. | 8 | | Cleveland. | 2 | 11.5 | Cheyenne. | T. | |
| Iron River. | 1 | | Columbus. | 2 | | Lander. | T. | |
| Ironwood. | 18 | | Dayton. | 1 | | Yellowstone Park. | T. | |

*Shore ice. † Floating ice. ‡ Ice gorged above. § Measurement impracticable. T. indicates trace.

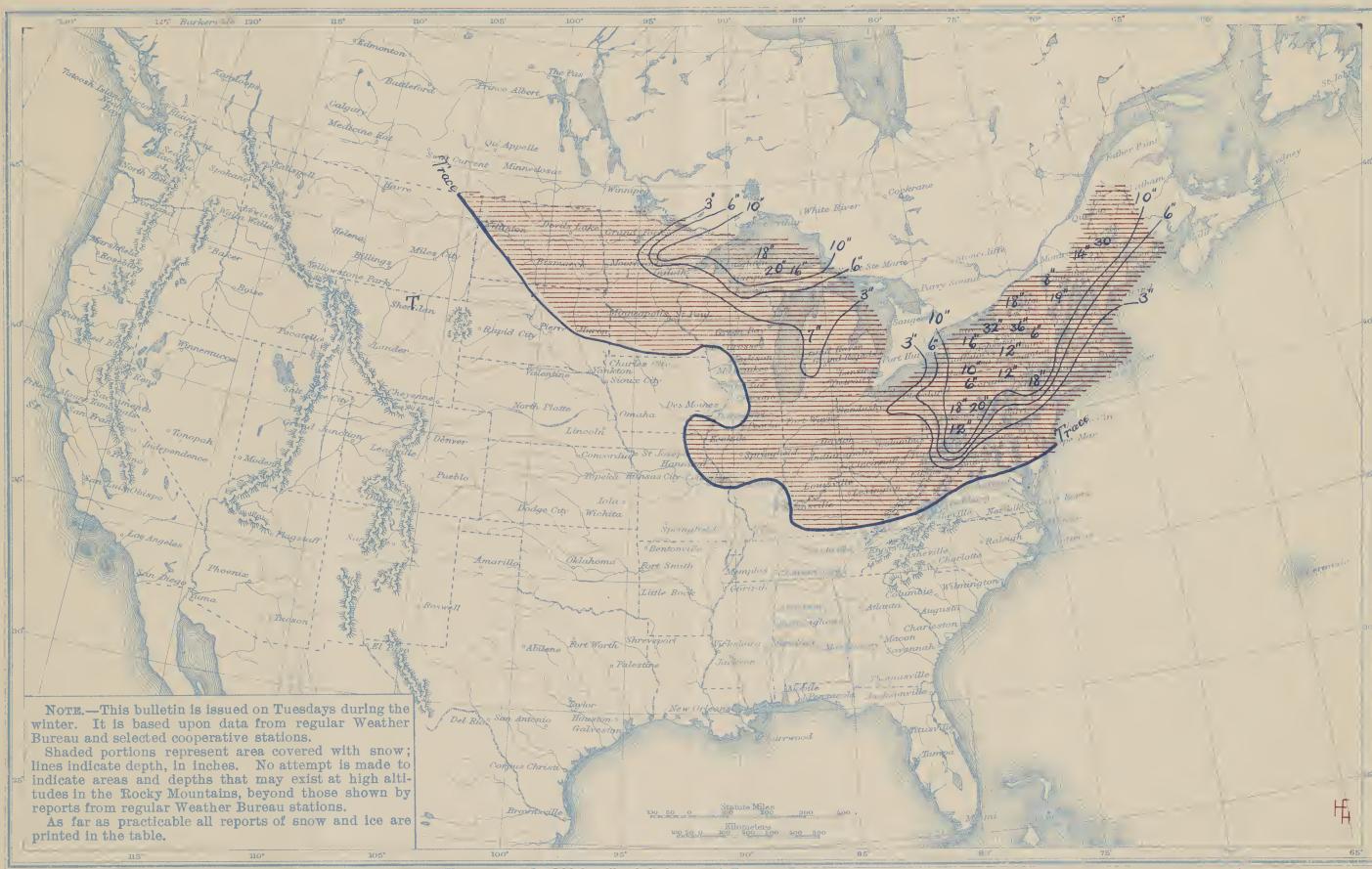
tion, where they are heavy. The Lake Michigan fields over the southern portion are moving with the wind. The straits are solid. The Lake Huron ice fields are over the northern and eastern portions and are moving. Lake St. Clair and the connecting rivers are frozen. The Lake Erie fields extend over the western and southern portions. There are not many fields on Lake Ontario. There is not so much ice now as last season at this date.

Hannibal, Mo., March 2.—Part of the channel in the Mississippi River is open.

P. C. DAY, Climatologist and Chief of Division.

MAR 11 1914
U. S. Department of Agriculture

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., March 10, 1914.

DEPTH OF SNOW.

Only small amounts of snow occurred during the past week in any section of the country, save in portions of the upper Ohio watershed, where the increases over the depths reported last week range from 2 to 6 inches. In the highlands above Pittsburgh the depths now range from 8 to 20 inches, with a water equivalent of from 2 to 4 inches, while over the lower elevations the depth of snow is much less, with a water equivalent of about 1 inch.

Over the watershed of the Susquehanna the depth of snow averages from about 5 to 20 inches, with a water equivalent of about 30 per cent, while over the Hudson watershed the depth averages about 13 inches, with extreme depths of nearly 3 feet at points in the Adirondacks.

Over the greater part of the winter wheat belt the snow covering has practically disappeared, and the amounts over the northern districts have been materially reduced, except in a few instances.

In the mountain regions of the West but little snow occurred during the week, and none is now reported on the ground at the lower levels. In the high mountains the stored snowfall appears above the normal in California, Utah, and portions of Colorado and Nevada; elsewhere the amounts are about normal or somewhat less, the deficiency being greatest in the more southern mountain regions.

ICE IN RIVERS AND HARBORS.

No decided temperature changes occurred during the week just ended, and the breaking up of ice in the rivers and lakes proceeded slowly under the influence of approaching spring. Small increases in thickness were reported from a few northern points, elsewhere the amounts of ice remained as reported last week, or were considerably reduced.

The Missouri River is now free of ice to the southward of Omaha, while above that point the thickness is everywhere less than a week ago. In the Mississippi floating ice is reported as far south as St. Louis, but considerable reductions occurred during the week in the amounts on the upper reaches of that river and its tributaries.

Only slight changes occurred during the week in the Lake region, the harbors still remaining closed, as a rule.

In New England there was some decrease, but the ice still holds, while in the Hudson no change occurred. No ice is reported on the Ohio itself, but the streams above Pittsburgh remain frozen, as a rule.

The following special reports have been received; that from Detroit relates to the conditions existing throughout the Great Lakes and is a summary of a large number of reports collected at that station:

Hartford, Conn., March 10.—In the Connecticut Valley, within the State of Connecticut, there are only traces of snow, but to the northward the depth averages 8 inches. The ice in the river holds, though it is deteriorating.

Albany, N. Y., March 10.—The snow in the Hudson and Mohawk valleys average 13 inches deep, the greatest depth reported being 34 inches at Trenton Falls, N. Y. The ice in the Hudson River averages 13 inches thick, but in the Mohawk only 10 inches.

Binghamton, N. Y., March 10.—In the watersheds of the upper Susquehanna and its tributaries the depth of snow averages 21 inches. This snow has a high water equivalent, apparently about 30 per cent.

Pittsburgh, Pa., March 9.—The accumulated amount of snow has increased during the past week over the Allegheny, Kiskiminetas, and upper Youghio-gheny watersheds, while it has decreased over the Monongahela and Beaver valleys. The depth in the eastern and northern highlands averages from about 8 to over 20 inches, with water equivalent from 2 to 4 inches. Even at the lower elevations, where the depth is much less, the water equivalent equals or exceeds 1 inch. The rivers remain frozen, except the lower Monongahela.

Detroit, Mich., March 10.—In Lake Superior the ice fields over the extreme western end and off Keweenaw Point have diminished, but those over the extreme eastern end have remained stationary. Northern Green Bay is still solid. The fields in Lake Michigan have moved off shore, and but few are reported over the central and southern portions. The ice is firm in the Straits of Mackinac and shows no change. In northern and southern Lake Huron the ice fields are slightly greater. There has been practically no change in the ice conditions in the connecting rivers. In Lake Erie the fields over the southern portion extend beyond vision, but there is some open water over the northern portion. Not much change has occurred in Lake Ontario. In the Great Lakes, as a whole, there is not as much ice as last year at this date.

St. Paul, Minn., March 9.—In the Mississippi River the channel is open from below the harbor here up to St. Anthony Falls.

P. C. DAY, Climatologist and Chief of Division.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., MARCH 9, 1914.

| Stations. | Show. | Ice in rivers, har- bors, etc. | Stations. | Show. | Ice in rivers, har- bors, etc. | Stations. | Show. | Ice in rivers, har- bors, etc. |
|---------------------------|--------|--------------------------------------|-------------------------------|--------|--------------------------------------|-----------------------------|--------|--------------------------------------|
| Connecticut. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | Pennsylvania. | Inches | Inches |
| Hartford | T. | * | Sault Ste. Marie | 8 | 18.0 | Bloomsburg | 14 | |
| New Haven | T. | 0.0 | South Haven | 6 | | Center Hall | 12 | |
| <i>Dist. of Columbia.</i> | | | <i>Minnesota.</i> | | | Clarion | 13 | |
| Washington | T. | ‡ | Angus | 1 | | Coatesville | 5 | |
| <i>Illinois.</i> | | | Collegeville | 2 | | Drifton | 18 | |
| Bloomington | T. | | Duluth | 2 | 25.0 | Emporium | 6 | |
| Chicago | T. | | Fergus Falls | 2 | | Erie | 2 | 10.0 |
| Danville | T. | | Fort Ripley | 2 | | Franklin | 6 | |
| Springfield | T. | | International Falls | 1 | | Greensboro | 1 | |
| <i>Indiana.</i> | | | Mankato | T. | | Greenville | 4 | |
| Bloomington | 1 | | Minneapolis | T. | | Harrisburg | 2 | 6.0 |
| Fort Wayne | T. | | Moorhead | 1 | 33.0 | Indiana | 18 | |
| Indianapolis | T. | | St. Paul | T. | * | Johnstown | 14 | |
| La Fayette | T. | | State Sanatorium | 11 | | Lawrenceville | 12 | |
| Marion | T. | | Winton | 9 | | Meadville | 2 | |
| Richmond | 1 | | <i>Missouri.</i> | | | Parkers Landing | 5 | |
| Terre Haute | 0 | 10.0 | Hannibal | T. | ‡ | Philadelphia | 1 | * |
| Winona Lake | 2 | | Maryville | T. | | Pittsburgh | 5 | 0.0 |
| <i>Iowa.</i> | | | St. Louis | 0 | † | Reading | 1 | 0.0 |
| Davenport | 0 | 7.0 | Unionville | T. | | Ridgway | 11 | |
| Des Moines | 0 | 10.0 | <i>Nebraska.</i> | | | Saltsburg | 8 | |
| Dubuque | 0 | 2 | Omaha | 0 | † | Susan | 8 | |
| Iowa City | T. | | <i>New Hampshire.</i> | | | Somerset | 12 | |
| Keokuk | T. | 7.0 | Concord | 6 | 22.0 | Sunbury | 5 | |
| Sioux City | 0 | 12.0 | Lancaster | 7 | | Towanda | 12 | |
| <i>Kentucky.</i> | | | West-Stewartstown | 14 | | Warren | 8 | |
| Beattyville | 1 | | <i>New Jersey.</i> | | | West Newton | 4 | |
| Greensburg | T. | | Atlantic City | 4 | | Williamsport | 3 | |
| Hopkinsville | T. | | Bridgeton | 2 | | <i>Rhode Island.</i> | | |
| Maysville | 1 | | Cape May | T. | 2.0 | Block Island | 1 | 0.0 |
| Williamsburg | T. | | Long Branch | 24 | | Narragansett Pier | 1 | |
| <i>Maine.</i> | | | Newton | 14 | | Providence | T. | 0.0 |
| Bangor | 6 | 20.0 | Trenton | 5 | 14.0 | <i>South Dakota.</i> | | |
| Eastport | T. | 0.0 | <i>New York.</i> | | | Huron | T. | 21.0 |
| Gardiner | 6 | 18.0 | Addison | 10 | | Yankton | 0 | 15.0 |
| Greenville | 39 | 36.0 | Albany | 12 | 9.0 | <i>Vermont.</i> | | |
| Lewiston | T. | 18.0 | Binghamton | 14 | | Bellows Falls | 7 | |
| Portland | 4 | 0.0 | Buffalo | 10 | 15.0 | Brattleboro | 4 | ‡ |
| <i>Maryland.</i> | | | Canton | 18 | | Burlington | 8 | 13.0 |
| Easton | T. | | Cooperstown | 22 | | Lyndonville | 13 | |
| Frederick | 2 | | Herkimer | 6 | | Northfield | 19 | |
| Oakland | 12 | | Ithaca | 9 | | Wells River | 10 | |
| <i>Massachusetts.</i> | | | Lowville | 24 | | White River Junc. | 6 | |
| Boston | T. | | New York | 3 | | <i>Virginia.</i> | | |
| Holyoke | 2 | | Ogdensburg | 8 | | Mount Weather | 4 | |
| Nantucket | T. | 0.0 | Oswego | 32 | 20.0 | Woodstock | 2 | * |
| Turners Falls | 1 | | Poughkeepsie | 18 | | Wytheville | T. | |
| <i>Michigan.</i> | | | Rochester | 16 | 18.0 | <i>West Virginia.</i> | | |
| Alpena | 3 | * | Rome | 36 | | Bayard | 17 | |
| Ann Arbor | T. | | Syracuse | 16 | | Elkins | 2 | * |
| Big Rapids | 1 | | Watervliet | 15 | | Fairmont | 1 | |
| Cadillac | 7 | | Watertown | 9 | | Huntington | 1 | |
| Calumet | 18 | | <i>North Dakota.</i> | | | Parkersburg | T. | 0.0 |
| Chatham | 16 | | Bismarck | T. | 34.0 | Rowlesburg | 6 | |
| Detroit | T. | 15.0 | Devils Lake | 2 | | | | |
| Escanaba | T. | 24.0 | Williston | T. | ‡ | <i>Wisconsin.</i> | | |
| Grand Haven | 2 | | | | | Ashland | 4 | |
| Grand Rapids | 2 | | | | | Eau Claire | 1 | |
| Harrisville | 2 | | | | | Green Bay | 0 | 10.0 |
| Houghton | 10 | 16.0 | | | | Hancock | 4 | |
| Iron Mountain | 1 | | | | | Koepenick | 7 | |
| Lansing | 12 | | | | | Lake Crosse | 0 | 12.0 |
| Ludington | T. | | | | | Lake Mills | 2 | |
| Manistee | 4 | † | | | | Madison | T. | |
| Marquette | 20 | 0.0 | | | | Milwaukee | T. | 0.0 |
| Newberry | 11 | | | | | New London | 3 | |
| Port Huron | T. | 18.0 | | | | Spooner | 2 | |
| Rock | 17 | | | | | Wausau | 2 | |
| Saginaw | 1 | 10.5 | | | | <i>Wyoming.</i> | | |
| St. Ignace | 4 | | | | | Sheridan | T. | |
| | | | | | | | | |

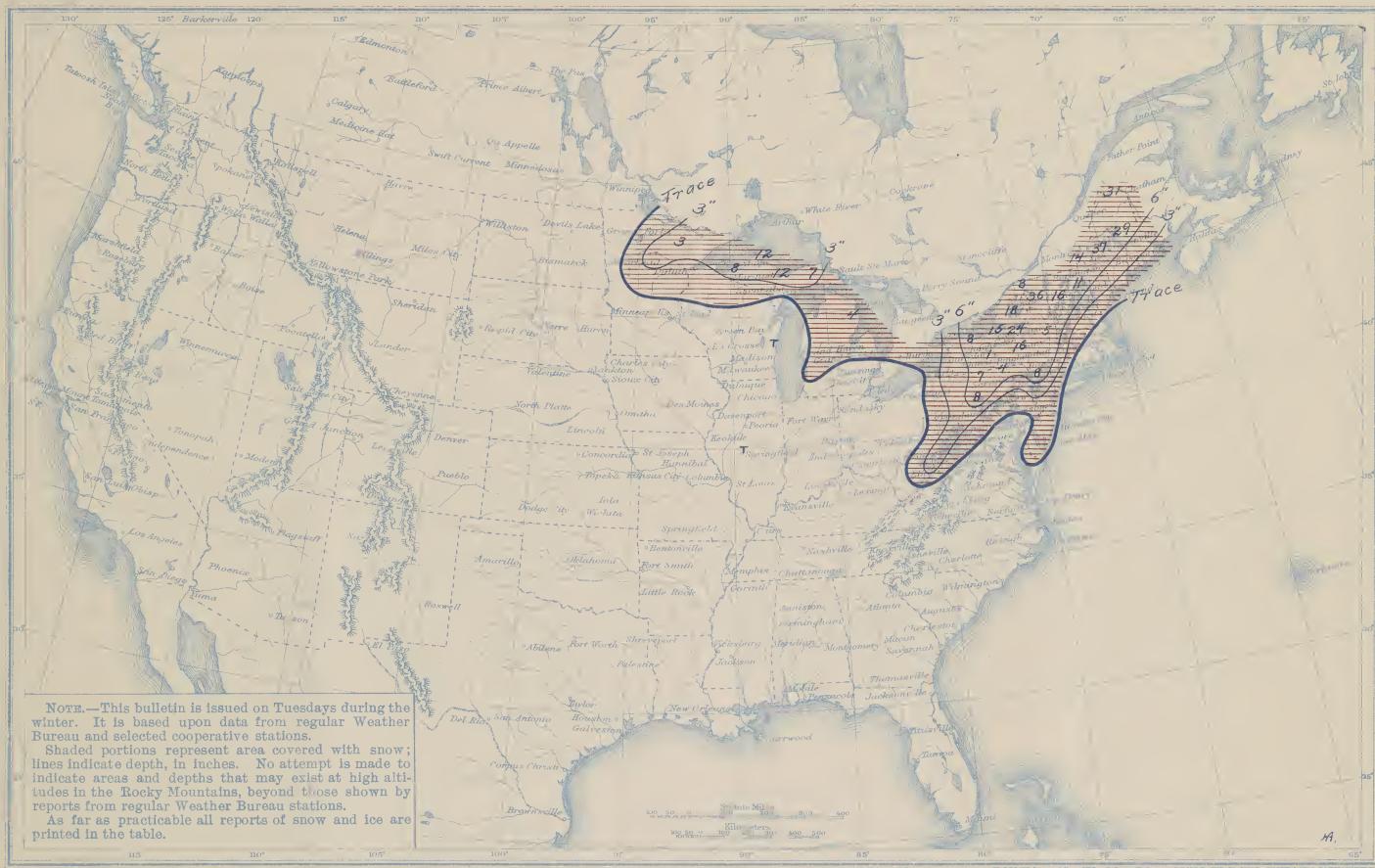
* Shore ice. † Floating ice. ‡ Ice gorged above. § Measurement impracticable. T. indicates trace.

St. Paul, Minn., March 9.—In the Mississippi River the channel is open from below the harbor here up to St. Anthony Falls.

P. C. DAY, Climatologist and Chief of Division.

MAR 21 1914

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., March 17, 1914.

DEPTH OF SNOW.

Some snow occurred in portions of the lower Lake region, the Ohio Valley, and the southern Appalachian Mountains near the middle of the week, but otherwise there was little or no snow during the entire week in any portion of the country, and rainfall was generally light as well. Moderately warm weather continued during the week, but the temperatures were not sufficiently high to cause any rapid melting over the districts where the snow covering was heaviest and the run-off was not sufficient to cause any marked rise in the main streams of the country.

There is still a considerable depth of snow with a large water content on the elevated portions and northern slopes of Pennsylvania and thence northward over much of New York and New England, and small amounts are reported from New Jersey and Delaware and the mountain portions of Maryland and West Virginia; elsewhere, save in the upper Lake region, the snow has entirely disappeared at all the lower elevations.

The following note on the weather outlook for the next few days has been furnished by the River and Flood Division:

With the exception of probable local rains within the next 24 hours the outlook for several days of fair weather is good. The fall in temperature forecast for Wednesday will doubtless temporarily check the runoff inaugurated by the recent high temperature. After that date the temperature will be favorable for a gradual thawing of the remaining snow.

ICE IN RIVERS AND HARBORS.

Moderately cool weather over the districts from the Mississippi River eastward during the first half of the week prevented any rapid breaking up of the ice on the rivers and lakes of the eastern portions of the country, but during the latter part there was a tendency to higher temperatures and it began to break up and move out more rapidly.

At the close of the week the ice had largely disappeared from the main streams of the Missouri and Mississippi valleys, although at points in the upper Missouri the ice remained solid, and in some of the smaller streams of that region only small amounts disappeared during the week. In Lake Superior there were but slight changes in the ice conditions during the week, but in Lakes Michigan and Huron the reductions were considerable, while in the lower Lakes much ice disappeared from the harbors.

The upper portions of the streams of New England are still heavily ice-covered and similar conditions exist in the Hudson, although there the ice is beginning to break up. The lower portions of the streams of the Atlantic coast south of the Hudson are generally open, and the ice in the upper portions is slowly breaking up.

No ice is reported in the Ohio below Pittsburgh, and in the headwaters above that point it is breaking up and moving out.

The following special reports have been received; that from Detroit relates to the conditions existing throughout the Great Lakes and is a summary of a large number of reports collected at that station:

Brattleboro, Vt., March 16.—On the hills in this vicinity the depth of snow ranges from 2 to 4 feet.

Hartford, Conn., March 17.—There are scattered patches of snow in the lower Connecticut Valley, and in the upper valley the depth averages 6 inches. The river below Hartford was opened to navigation by tugs on the 15th.

Albion, N. Y., March 17.—In the Hudson Valley the snow averages 10 inches deep, and in the Mohawk 8 inches. The ice averages 12 inches thick in the Hudson River and 8 inches in the Mohawk, but in both rivers the ice is rotten.

Binghamton, N. Y., March 17.—Over the watersheds tributary to the upper Susquehanna the snow averages 15 inches deep, with numerous deep drifts. The snow has a large water content. The rivers for two-thirds of their length are covered with rotting ice.

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., MARCH 16, 1914.

| Stations. | Show. Inches | Ice in rivers, etc. Inches | Stations. | Show. Inches | Ice in rivers, etc. Inches | Stations. | Show. Inches | Ice in rivers, etc. Inches |
|-----------------------|-----------------|-------------------------------------|------------------------|-----------------|-------------------------------------|------------------------|-----------------|-------------------------------------|
| Connecticut. | | | Minnesota. | | | Ohio—Cont'd. | | |
| West Cornwall..... | 12 | | Collegeville..... | T. | | Sandusky..... | 0 | 10.0 |
| Delaware. | | | Duluth..... | T. | 20.0 | Toledo..... | 0 | † |
| Millsboro..... | T. | | Moorhead..... | 0 | 30.0 | Pennsylvania. | | |
| Illinois. | | | St. Paul..... | 0 | * | Center Hall..... | 8 | |
| Springfield..... | T. | | State Sanatorium..... | 4 | | Clarion..... | 4 | |
| Iowa. | | | Winton..... | 3 | | Coatesville..... | T. | |
| Davenport..... | 0 | † | New Hampshire. | | | Drifton..... | 12 | |
| Keokuk..... | 0 | * | Bethlehem..... | 11 | | Emporia..... | T. | |
| Maine. | | | Concord..... | T. | 23.0 | Erie..... | 0 | 5.0 |
| Bangor..... | 4 | 20.0 | Hanover..... | 12 | | Franklin..... | 2 | |
| Cornish..... | 5 | | West Stewartstown..... | 14 | | Harrisburg..... | T. | † |
| Eastport..... | T. | 0.0 | New Jersey. | | | Hyndman..... | T. | |
| Gardiner..... | 4 | 16.0 | Atlantic City..... | T. | | Johnsonburg..... | 3 | |
| Greenville..... | 37 | 29.0 | Long Branch..... | 1 | | Lawrenceville..... | 7 | |
| Lewiston..... | T. | 17.0 | Newton..... | 9 | | Pittsburgh..... | 0 | † |
| Millinocket..... | 29 | | Phillipsburg..... | 2 | | Reading..... | T. | |
| Portland..... | 1 | 0.0 | Trenton..... | 1 | * | Saltsburg..... | 2 | |
| Van Buren..... | 81 | | Tuckerton..... | 3 | | Sunbury..... | T. | |
| Maryland. | | | New York. | | | Towanda..... | 4 | |
| Oakland..... | 3 | | Albany..... | 5 | ‡ | Warren..... | 4 | |
| Princess Anne..... | T. | | Binghamton..... | 8 | | Rhode Island. | | |
| Massachusetts. | | | Brockville..... | 24 | | Block Island..... | T. | |
| Amherst..... | T. | | Buffalo..... | 3 | 13.5 | Narragansett Pier..... | T. | |
| Concord..... | T. | | Canton..... | 1 | | South Dakota. | | |
| Michigan. | | | Copperportown..... | 16 | | Huron..... | 0 | 16.0 |
| Alpena..... | T. | * | Ithaca..... | 1 | | Yankton..... | 0 | † |
| Battle Creek..... | T. | | Lake Placid..... | 36 | | Vermont. | | |
| Big Rapids..... | T. | | Lowville..... | 18 | | Brattleboro..... | 2 | 16.0 |
| Calumet..... | 12 | | Malone..... | 8 | | Burlington..... | 1 | 14.0 |
| Escanaba..... | 0 | 20.0 | Ogdensburg..... | 3 | | Northfield..... | 16 | |
| Grand Rapids..... | T. | | Oswego..... | 15 | 19.5 | Virginia. | | |
| Harrisville..... | 4 | | Plattsburg..... | 6 | | Woodstock..... | T. | |
| Houghton..... | 3 | 11.0 | Rochester..... | 8 | ‡ | West Virginia. | | |
| Iron River..... | T. | | Rome..... | 12 | | Elkins..... | T. | 0.0 |
| Ironwood..... | 8 | | Syracuse..... | 9 | | Glenville..... | 1 | |
| Ludington..... | 0 | * | Watertown..... | 3 | | Pickens..... | 10 | |
| Marquette..... | 12 | * | North Dakota. | | | Wisconsin. | | |
| Newberry..... | 7 | | Bismarck..... | 0 | 24.0 | Ashland..... | 2 | |
| Port Huron..... | T. | 10.0 | Williston..... | 0 | ‡ | Green Bay..... | 0 | † |
| Rock..... | 6 | | Ohio. | | | Koepenick..... | 2 | |
| Saginaw..... | T. | 4.0 | | | | Sheboygan..... | T. | |
| Sault Ste. Marie..... | 2 | 21.0 | Cleveland..... | 0 | 8.0 | | | |
| South Haven..... | T. | | Hiram..... | T. | | | | |

* Shore ice. † Floating ice. ‡ Measurement impracticable. T. indicates trace.

Pittsburgh, Pa., March 16.—Snow has disappeared over most of the watersheds, but there is probably much left on northward slopes. The ice has started to move out of the lower Allegheny and lower Youghiogheny rivers.

Sandusky, Ohio, March 16.—The harbor ice is so soft that a channel was opened to-day.

Detroit, Mich., March 17.—In Lake Superior there are now extensive moving fields of ice off Keweenaw Point and over the extreme eastern portion. The ice in Whitefish Bay is solid. In Green Bay there has been no considerable change. In Lake Michigan there are practically no fields over the central and southern portions. In the Straits of Mackinac the ice is softening. In Lake Huron there are extensive fields over the eastern and southern portions. The ice is moving out of Lake St. Clair, and the Detroit River is open. In Lake Erie the fields are breaking up over the southern part, but remain intact over the eastern portion, while there is open water along the northern shore. In Lake Ontario the fields are disappearing. There is less ice now in all the lakes than there was last year at this date.

Duluth, Minn., March 16.—The harbor ice here is honeycombing.

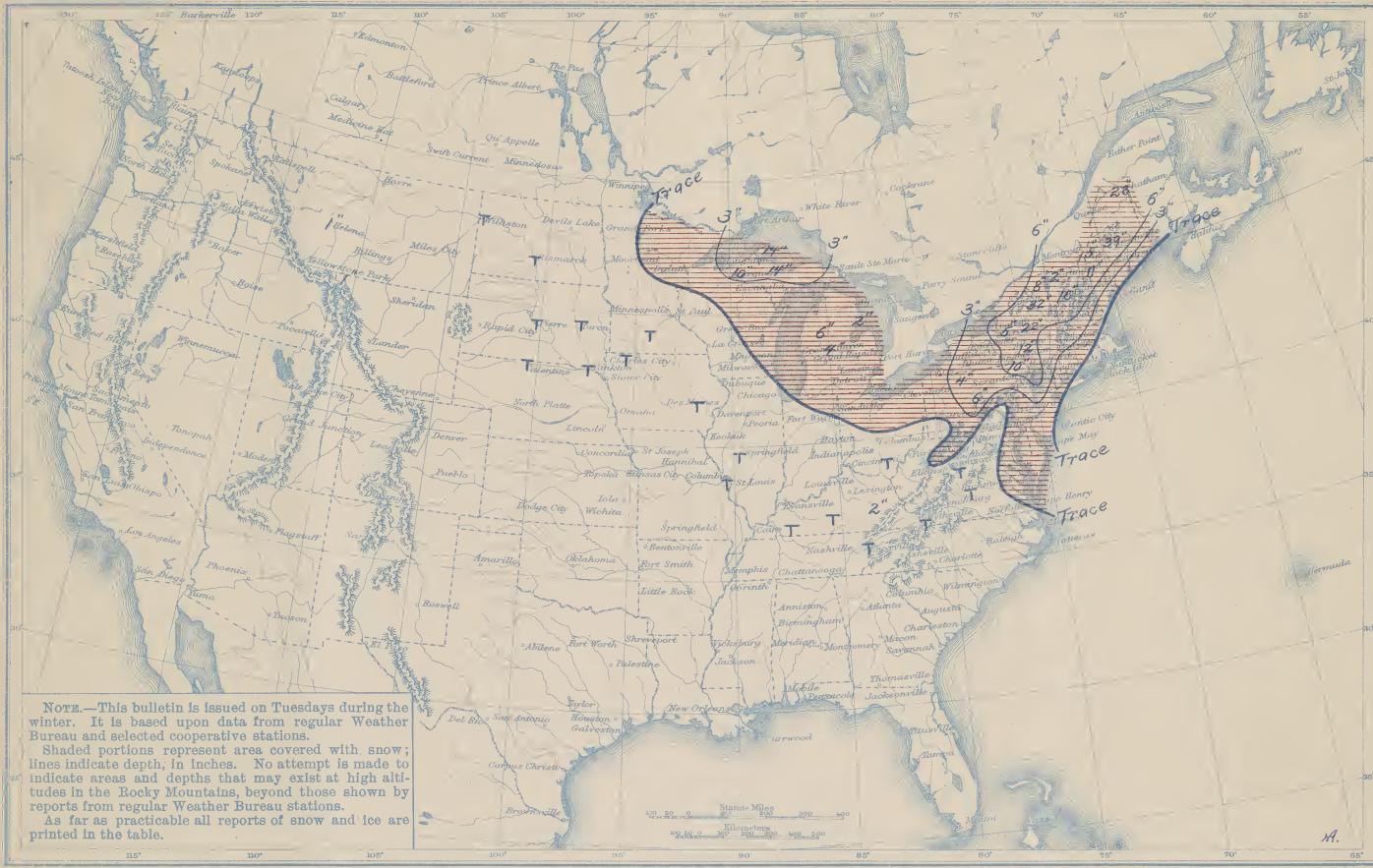
Yankton, S. Dak., March 16.—The ice in the Missouri River here broke up and moved out quietly on the 12th, but there is a little floating ice to-day.

P. C. DAY, Climatologist and Chief of Division.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.

CHARLES F. MARVIN, CHIEF.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., March 24, 1914.

DEPTH OF SNOW.

Small amounts of snow occurred during Wednesday and Thursday from the Lake region and Ohio Valley northeastward to New England, and about the same time local snows occurred in the northern Rocky Mountain region and at points in the Plains States.

During Thursday and Friday storm area moved from the west Gulf States northeastward to the coast of North Carolina, accompanied by rain and snow. The rains were heavy at points in Texas and the Mississippi Valley, and unusually heavy snows for March fell over much of Virginia and portions of adjoining States. Light snow occurred locally in the Upper Mississippi Valley, the Lake region and North Atlantic States during the latter part of the week, but over much of the western Mountain districts there appears to have been no snow during the entire week.

The snow that fell during the week largely melted by the close, while but little change occurred in the area snow covered at the end of the preceding week. The snow covering over large portions of Pennsylvania and New York decreased several inches in depth during the week, but it is improbable that the amount of water now represented in the snow is appreciably less than at the same time last week.

In New England the snow remains about as reported a week ago, the covering being quite heavy over the interior portions with a large water content. In the upper Lake region there is slightly more snow than was reported last week, but the amounts are now very generally less than usual at this period of the year.

A marked contrast appears in the snow conditions over the North Atlantic States and the upper Lake region this year as compared with conditions at the same date last year. Now the North Atlantic States are largely heavily covered, while one year ago they were entirely free of snow. At the same time the upper Lake region had a heavy covering of snow, while at the present time the covering is generally quite light.

The following note on the weather outlook for the next few days is furnished by the River and Flood Division:

Fair weather with slowly rising temperatures in the daytime is probable in northeastern districts until about Thursday night. A short period of unsettled weather with rain will probably set in on Friday.

ICE IN RIVERS AND HARBORS.

Unseasonably low temperatures for the latter half of March prevailed during much of the week just ended over the districts to eastward of the Rocky Mountains. As a result, some additional ice formed over the upper Lakes and at points in New England, and not much change occurred in other districts where ice was reported last week.

The ice still holds at points in the upper Missouri River and some of its tributaries, and floating ice is reported as far south as Omaha. The Mississippi and its tributaries appear nearly free of ice, and none is reported on the Ohio or the main streams of the Atlantic coast south of the Hudson.

In New England some ice disappeared from the lower portions of the rivers, but it remains intact in the upper portions. There was a very general reduction in the amount of ice in the lower Lakes and over southern Lake Huron; but over the greater part of the upper Lakes little change occurred during the week, some increases being reported from Lake Superior and northern Lake Michigan.

The following special reports have been received; that from Detroit relates to the conditions existing throughout the Great Lakes and is a summary of a large number of reports collected at that station:

Albany, N. Y., March 24.—In the Hudson Valley the snow averages 6 inches deep, and in the Mohawk 7 inches, the greatest depth reported being 24 inches at Trenton Falls, N. Y. The ice averages 7 inches thick in the Hudson River, but the Mohawk River is open at most of the stations reporting.

Binghamton, N. Y., March 24.—The snow ranges in depth from 6 inches in the valley to 2 feet on the hills, the general average depth being about 12 inches. The snow has a large water content, apparently over 40 per cent. Numerous ravines are filled with drifts.

Pittsburgh, Pa., March 23.—In the watersheds tributary to the upper Ohio there is but little snow at the lower levels; in the eastern highlands, however, and over the upper Allegheny watersheds the depths range from 2 to 6 inches, while on northern slopes there still remain large amounts of snow and ice.

Detroit, Mich., March 24.—In Lake Superior there are extensive ice fields off

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., MARCH 23, 1914.

| Stations. | Show. Inches | Ice in rivers, har- bors, etc. | Stations. | Show. Inches | Ice in rivers, har- bors, etc. | Stations. | Show. Inches | Ice in rivers, har- bors, etc. |
|----------------|-----------------|--------------------------------------|-------------------|-----------------|--------------------------------------|-------------------|-----------------|--------------------------------------|
| Connecticut. | | | Michigan—Cont'd. | | | Ohio—Cont'd. | | |
| Hawleyville | 2 | | Saginaw | T. | * | Wauseon | 1 | |
| West Cornwall | 1 | | Sault Ste. Marie | 1 | 21.0 | Waverly | T. | |
| Illinois. | | | Minnesota. | | | Youngstown | T. | |
| Springfield | T. | | Duluth | T. | 21.0 | Pennsylvania. | | |
| Indiana. | | | Grand Meadow. | T. | | Center Hall | 6 | |
| Fort Wayne | T. | | Mankato | T. | | Clarion | 6 | |
| Knox | T. | | Moorhead | 0 | 80.0 | Drift | 9 | |
| Iowa. | | | St. Paul | 0 | * | Emporia | 1 | |
| Des Moines | 0 | * | State Sanatorium | 1 | | Erie | T. | 2.5 |
| Esteville | T. | | Missouri. | | | Franklin | 1 | |
| Iowa City | T. | | Ironton | T. | | Greenville | 2 | |
| Kentucky. | | | St. Louis | T. | 0.0 | Harrisburg | T. | 0.0 |
| Beattyville | 2 | | Montana. | | | Indiana | 1 | |
| Bowling Green | T. | | Helena | 1 | | Johnstown | T. | |
| Eubank | T. | | Nebraska. | | | Lawrenceville | 3 | |
| Greensburg | T. | | Omaha | 0 | † | Meadville | 1 | |
| Hopkinsville | T. | | Valentine | T. | | Parkers Landing | 2 | |
| Maine. | | | New Hampshire. | | | Pittsburgh | T. | 0.0 |
| Bangor | T. | 18.0 | Bethlehem | 11 | | Reading | T. | 0.0 |
| Eastport | T. | 0 | Concord | T. | 22.0 | Ridgway | 1 | |
| Gardiner | 2 | 15.0 | Hanover | 12 | | Salisbury | T. | |
| Greenville | 39 | 32.0 | Keene | 2 | | Towanda | T. | |
| Lewiston | T. | 15.0 | West Stewartstown | 15 | | Warren | 4 | |
| Millinocket | 26 | | New Jersey. | | | Rhode Island. | | |
| Portland | T. | 0.0 | Atlantic City | T. | | Block Island | T. | 0.0 |
| Van Buren | 28 | | Cape May | T. | 1.0 | Narragansett Pier | T. | |
| Maryland. | | | Long Branch | T. | | Providence | T. | 0.0 |
| Baltimore | T. | 0.0 | Newton | 6 | | South Dakota. | | |
| Frederick | T. | | Trenton | T. | 0.0 | Huron | T. | 13.5 |
| Massachusetts. | | | New York. | | | Pierre | T. | † |
| Amherst | T. | | Albany | T. | 1.5 | Yankton | T. | † |
| Boston | T. | | Binghamton | 10 | | Tennessee. | | |
| Concord | T. | | Bouckville | 22 | | Knoxville | T. | 0.0 |
| Fitchburg | 1 | | Buffalo | 2 | | Vermont. | | |
| Mansfield | T. | | Canton | 3 | | Bellows Falls | 3 | |
| Nantucket | T. | 0.0 | Cooperstown | 17 | | Brattleboro | 3 | 16.0 |
| Turners Falls | 6 | | Herkimer | 2 | | Burlington | 2 | 14.0 |
| Michigan. | | | Ithaca | T. | | Northfield | 16 | |
| Alpena | T. | † | Lake Placid | 32 | | St. Johnsbury | 3 | |
| Ann Arbor | T. | | Lowville | 12 | | Wells River | 5 | |
| Battle Creek | 1 | | New York | T. | | White River June | 6 | |
| Big Rapids | 4 | | Ogdensburg | 1 | | Virginia. | | |
| Cadillac | 6 | | Oswego | 10 | 17.5 | Cape Henry | T. | 0.0 |
| Calumet | 14 | | Plattsburgh | 8 | | Lynchburg | T. | 0.0 |
| Chatham | 14 | | Poughkeepsie | 1 | | Richmond | T. | 0.0 |
| Detroit | T. | 0.0 | Rochester | 4 | 0.0 | Staunton | T. | |
| Escanaba | T. | 28.0 | Rome | 4 | | Wytheville | T. | |
| Grand Haven | T. | | Setauket | T. | | West Virginia. | | |
| Grand Rapids | 1 | | Syracuse | 5 | | Glenville | 2 | |
| Harrisville | 2 | | Watertown | 2 | | Rowlesburg | 2 | |
| Houghton | 6 | 12.5 | North Dakota. | | | Wisconsin. | | |
| Iron Mountain | 1 | | Bismarck | T. | 24.0 | Ashland | T. | |
| Iron River | T. | | Williston | T. | ‡ | Green Bay | 0 | † |
| Ironwood | 10 | | Ohio. | | | Hancock | T. | |
| Lansing | T. | | Coshocton | 1 | | Koepenick | 2 | |
| Ludington | 2 | † | Hiram | 2 | | Lake Mills | T. | |
| Manistee | 1 | | Marion | 1 | | Milwaukee | T. | 0.0 |
| Marquette | 14 | 3.5 | New Bremen | T. | | New London | T. | |
| Newberry | 5 | | Sandusky | T. | † | Sheboygan | T. | |
| Port Huron | T. | 5.0 | Tiffin | T. | | Spooner | T. | |
| | | | Yellowstone Park | 1 | | Wyoming. | | |

*Shore ice. †Floating ice. ‡Ice gorged above. § Measurement impracticable. T. indicates trace.

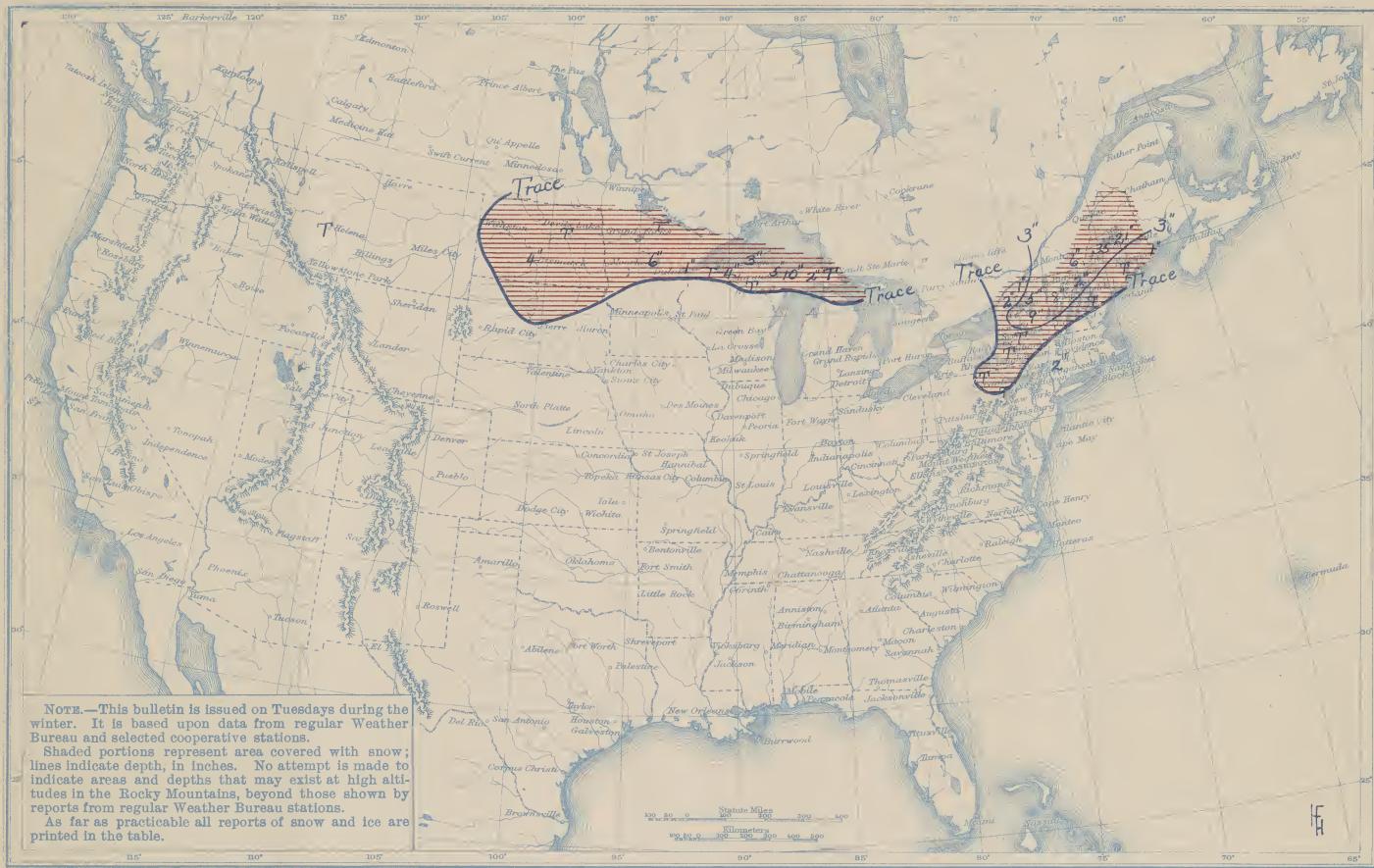
Keweenaw Point and over the eastern portion, while in Whitefish Bay and in Green Bay the ice is solid. In Lake Michigan the fields are confined to the southeastern portion, while in the Straits of Mackinac there has been no change during the week. In Lake Huron there are extensive ice fields from Presque Isle southward to beyond Thunder Bay and over the central portion, but the field over the extreme southern portion is disappearing. The ice is running freely from Lake St. Clair. In Lake Erie the ice fields over the western and southern portions are breaking up and moving with the winds, but there has been no change over the eastern portion. In Lake Ontario the fields are disappearing. In the Great Lakes as a whole there is not as much ice now as at this time last year.

P. O. DAY, Climatologist and Chief of Division.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.

CHARLES F. MARVIN, CHIEF.

SNOW AND ICE BULLETIN.



WASHINGTON, D. C., March 31, 1914.

DEPTH OF SNOW.

Some snow occurred over extreme northern districts from the Rocky Mountains eastward to the Lake Superior region near the first of the week, but otherwise no appreciable amounts of snow appear to have occurred.

The warm rains of the latter part of the week carried off the greater part of the considerable body of snow that covered Pennsylvania and New York at the beginning of the week, causing high waters in most of the streams of these States. Considerable depths still remain, however, in the Adirondack regions of northern New York and in the mountains and northern portions of New England. The snow has disappeared from the Lake region, except along the southern shore of Lake Superior, but portions of Minnesota and North Dakota which were free of snow last week are now lightly covered.

In the mountain States of the West the latest reports available indicate unusually large amounts of well packed snow in the mountains of California, Nevada, and Utah, with prospects for an abundant supply of water for irrigation and other purposes during the coming summer.

In Colorado, New Mexico, and Arizona reports indicate the amounts of snow stored in the mountains are near the normal and the outlook for water from that source is satisfactory. In Wyoming, Idaho, and Montana there appears to be less snow stored in the mountains than usual, while in Washington and Oregon the supply is probably near the average.

ICE IN RIVERS AND HARBORS.

Cold weather for the period of the year continued over the northern districts during much of the week, and ice conditions remained nearly as reported last week. The ice still holds at points in the upper Missouri River and some of its northern tributaries, as well as in the Red River of the North. The harbors of Lake Superior remain closed, and heavy ice covers some of the protected harbors of northern Lake Michigan and the adjacent straits.

On the streams and lakes of interior and northern New England little change occurred, but in the southern portions considerable ice appears to have broken up and moved out of the streams.

Under the influence of heavy rains and moderately warm weather near the end of the week in New York and Pennsylvania the snow melted rapidly, causing high waters, which broke up and carried out most of the ice still remaining on the streams of those States. In the lower Lakes the harbors are now entirely free of ice, except at a few points.

The following special reports have been received; that from Detroit relates to the conditions existing throughout the Great Lakes and is a summary of a large number of reports collected at that station:

Leviston, Me., March 30.—The ice in the Androscoggin River here is breaking up.

Brattleboro, Vt., March 30.—There is still snow back on the hills. The Connecticut River here is partly open.

Hartford, Conn., March 31.—The ground in the Connecticut Valley is bare ex-

DEPTH OF SNOW AND THICKNESS OF ICE AT 8 P. M., MARCH 30, 1914.

| Stations. | Snow | Ice in rivers, har- bors, etc. | Stations. | Snow | Ice in rivers, har- bors, etc. | Stations. | Snow | Ice in rivers, har- bors, etc. |
|--------------------|--------|--------------------------------------|--------------------------|--------|--------------------------------------|--------------------|--------|--------------------------------------|
| Connecticut. | Inches | Inches | Michigan—Cont'd. | Inches | Inches | New York—Cont'd. | Inches | Inches |
| West Cornwall..... | 2 | ..... | Sault Ste. Marie..... | T. | 21.0 | Herkimer..... | T. | ..... |
| Maine. | | | Minnesota..... | | | Lake Placid..... | 5 | ..... |
| Bangor..... | T. | 15.0 | Duluth..... | 1 | 20.0 | Lowville..... | 3 | ..... |
| Cornish..... | T. | 0.0 | Fergus Falls..... | T. | ..... | Malone..... | 1 | ..... |
| Eastport..... | 1 | 0.0 | International Falls..... | T. | ..... | Oswego..... | 0 | 5.0 |
| Gardiner..... | T. | 9.0 | Moorehead..... | 1 | 26.0 | Thurman..... | 9 | ..... |
| Greenville..... | 85 | 29.0 | State Sanatorium..... | 6 | ..... | North Dakota..... | | |
| Lewiston..... | T. | 2 | Montana..... | | | Bismarck..... | 4 | 24.0 |
| Millinocket..... | 21 | ..... | Helena..... | T. | ..... | Devils Lake..... | T. | ..... |
| Portland..... | T. | 0.0 | New Hampshire..... | | | Williston..... | T. | 2 |
| Michigan. | | | Bethlehem..... | 2 | ..... | Pennsylvania..... | | |
| Alpena..... | T. | * | Hanover..... | 4 | ..... | Driton..... | T. | ..... |
| Calumet..... | 8 | ..... | Keene..... | T. | ..... | Lawrenceville..... | T. | ..... |
| Chatham..... | 10 | ..... | West Stewartstown..... | 6 | ..... | South Dakota..... | | |
| Escanaba..... | 0 | 18.0 | New Mexico..... | | | Huron..... | 0 | 8.5 |
| Houghton..... | 3 | 12.0 | Santa Fe..... | T. | ..... | Pierre..... | T. | * |
| Iron River..... | T. | ..... | New York..... | | | Yankton..... | 0 | † |
| Ironwood..... | 4 | ..... | Addison..... | T. | ..... | Vermont..... | | |
| Ludington..... | 0 | † | Albany..... | T. | 0.0 | Brattleboro..... | 0 | * |
| Marguerite..... | 5 | 3.5 | Binghamton..... | T. | ..... | Burlington..... | 3 | 11.5 |
| Newberry..... | 2 | ..... | Buffalo..... | 0 | † | Northfield..... | 8 | ..... |
| Port Huron..... | 0 | † | Canton..... | 2 | ..... | Wisconsin..... | | |
| Rock..... | 4 | ..... | Cooperstown..... | 7 | ..... | Ashland..... | T. | ..... |

* Shore ice.

† Floating ice.

‡ Measurement impracticable.

T. indicates trace.

cept in the extreme northern portion. The Connecticut River is open in places as far north as Wells River, and the ice remaining is badly rotted.

Albany, N. Y., March 31.—In the Hudson Valley the snow ranges from a trace at Albany to 9 inches at Thurman, N. Y. There are only traces of snow in the Mohawk Valley. The Hudson River is open south of the mouth of the Hoosick River, with some floating ice. There is only floating ice in the Mohawk River.

Binghamton, N. Y., March 31.—In some localities in the northern portion of the watersheds the snow averages 8 inches in depth, but lies mostly in drifts. The rivers are free from ice.

Buffalo, N. Y., March 30.—The easterly winds have moved the ice up the lake.

Detroit, Mich., March 31.—The ice fields over the central and eastern portions of Lake Superior are breaking up and moving with the wind, but there has been no considerable change in St. Marys River. The ice is breaking up over the southern portion of Green Bay, and in Lake Michigan there are no fields over the southern and central portions. In the Straits of Mackinac the ice is diminishing in thickness, but holds intact. In Lake Huron the fields have greatly diminished, and St. Clair and Detroit rivers are now open. The ice fields have disappeared from the western and central portions of Lake Erie, and are moving with the wind over the eastern portion. In Lake Ontario the fields have disappeared and the harbors are opening. In the Great Lakes as a whole there is not as much ice as last season at this date.

P. C. DAY, Climatologist and Chief of Division.

NOTE.—This will be the last bulletin of this series for the season of 1913-14.

Bulletins showing the condition of the ice in the Great Lakes will probably be issued from the Weather Bureau office in Detroit, Mich., for several weeks. Copies may be secured by addressing the office at that place.